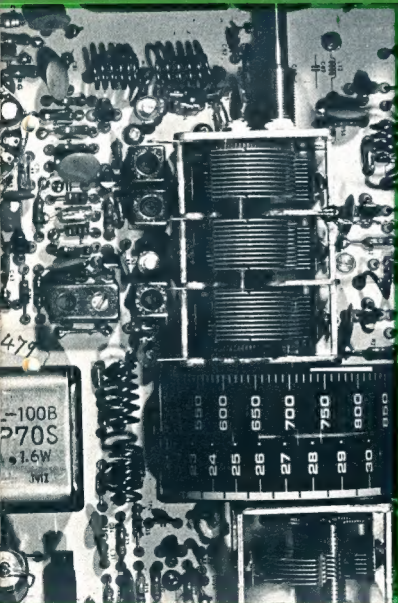


# amateur radio

JUNE, 1974



- REPORT ON 1974  
FEDERAL CONFERENCE

- VK8IZ DOUBLE  
INVERTED VEE

- AUDIO DERIVED  
AGC FOR SSB  
RECEIVERS

- FURTHER IDEAS  
ON THE G5RV

- DESIGN OF  
NORMAL-MODE  
HELIX ANTENNAE

- VK-ZL-OCEANIA  
1973 CONTEST  
RESULTS

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

# GRID DIP METER SPECIFICATION



**Model TE-15**  
Freq. Range: 440kHz-280MHz  
in 6 Coils  
A Coil 0.44-1.3MHz  
B Coil 1.3-4.3MHz  
C Coil 4.14MHz  
D Coil 14.4MHz  
F Coil 120-280MHz  
Transistor: 3 TR's & 1 Diode  
Meter: 500uA F5  
Battery: 9V (DL-906P)  
Dimensions: 190x80x40mm  
Weight: 750g

**Price \$38.50**  
P & P \$1.00

# Model HE-22D Model-I TE-22D

Freq. Range: Sin: 20Hz-200kHz  
Square: 20Hz-25kHz  
Output Voltage: Sine: 7 volt  
Square 7 volt  
Output Impedance: 1000 ohm  
Freq. Accuracy: +3% + 2Hz  
Distortion: Less than 2%  
Tube Complement: 6BM8  
12 AT7, 624  
Power Source: 105-125, 220-240V AC, 50/60 cps, 19W  
With Attenuation Range  
4 Ranges—1/1, 1/10, 1/100, 1/1K

**Price \$49.50**  
P & P \$2.00

# DELUXE AUDIO GENERATOR SPECIFICATION



Compact-Save Saving  
Printed Circuit for uniform  
Characteristics.  
Low Distortion  
Dimensions: 140 x 215 x 170mm  
Weight: 2.8kg.

# DX150B REALISTIC WITH SEPARATE SPEAKER



The popular REALISTIC DX150B which has gone from strength to strength with amateurs, short-wave and broadcast listeners alike, now has a further improvement. A SEPARATE MATCHING SPEAKER included.  
The DX150B gives long-range, world-wide realistic reception on 4 bands, including Broadcast. Fully transistorized solid state—no warm-up delays, the DX150B will run on dry cells if current fails or is not available, will operate from a car's cigarette lighter or any 12V DC source. A 240V AC power supply is also built in. Over 30 semi-conductors—product-detector for SSB/CW, plus fast and slow AVC—variable pitch BFO—illuminated electrical band-pass, fully calibrated for amateur bands—cascade RF stage—ANL for RF and AF-xenon stabilised-OTL audio-illuminated "S" meter.

**Price \$225.00**  
P & P \$2.00

# LAFAYETTE HA-600A SOLID STATE GENERAL COVERAGE

5 BANDS 150-400 kHz, 550-1600 kHz (Broadcast band), 1.6-4.8 MHz, 4.8-14.6 MHz, 10.5-30 MHz.  
Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.  
● Field Effect Transistors in RF Mixer and Oscillator Stages.  
● Two Mechanical Filters for exceptional selectivity.  
● Voltage Regulated with Zener Diodes.  
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● Continuous Electrical Bandspread Calibrated 80-100M Amateur Bands.  
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● Speaker Impedance: 4 to 16 ohms.



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Also available — HA-800 Amateur Band 6 Bands 3.5MHz to 29.7MHz and 50-56MHz as above with 100kHz calibration facility: \$210.00, 100kHz Xtal Extra \$10.75. P & P \$2.00

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This is an all solid state, wide-band RF Signal Generator which produces low impedance low distortion RF signals. It is highly dependable and easy to operate, and is a handy working instrument for service benches and electronic equipment production centres.

**SPECIAL FEATURES**  
1. Generates wide range signals from 100kHz to 30MHz in six frequency ranges.  
2. All solid state construction for instant waveforms, compact and lightweight portability.  
3. Includes 400kHz signal source for modulation of output signal, which can be modulated by external sources.

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Ericsson Type manufactured by L. M. Ericsson. As used by PMG Dept. As new condition, Dial in base. \$19.50 Tested, plus 75c Black Phone, Chrome Dial Standard type, Robust construction. \$7.85. Few only plus 75c Plastic Type, Standard PMK type. Manufactured by L. M. Ericsson. As new tested. All phones fitted with standard phone plug and socket. \$17.50, p & p 75c Double Phone Plug, 6.5mm 75c Standard 2 Circuit Phone Plug PMG Type 30c PMG Type Telephone, 4 digit, 48 Volt operation 69c PMG Type Telephone Plug & Socket, round type PMG Type Phone Plug & Socket, standard Ericsson Type White Plastic 95c per pair PMG TEEER Telephone Extension Bells, 48V \$2.00 230 Volt RVB Horn Tested \$7.50

# TRIO 3" OSCILLISCOPE DC — 1.5 MHz MODEL CO-1303A



## SPECIAL FEATURES

1. Vertical sensitivity of 20 mV/cm, three step attenuation, AC DC operation & wideband frequency response from DC to 1.5MHz.
2. DC vertical and horizontal amplifiers for wide versatility make possible external sweep speeds of less than 1Hz.
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5. Direct input to 150MHz for SSB and AM transmission monitoring.

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Brand new PMG-type relay racks containing relays, capacitors, transistors, reed relays and many other small components  
**\$8**

Other larger units from  
**\$15**

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Vic., 3121

# HAM

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Phones: 67-7329, 67-4286 All Mail to be addressed to above address

Our Disposals Store at 104 HIGBETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 10.30 a.m. to 5.0 p.m., and on Saturdays to midday.

# amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910



**JUNE, 1974**  
**VOL. 42, No. 6**  
**Price, 50 cents**

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Category "B"

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### FRONT COVER

An Interesting internal view of part of the Barlow Wadley receiver.

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Copy is required by the **third of each month**. Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

### Advertising:

Advertising material should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 25th of the second month preceding publication. Phone: 24-8652.

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P.O. Box 150, Toorak, Vic., 3142

## DIVISIONAL BROADCASTS

Do you have the time and want to keep in touch with events? If so here are the latest details available of Divisional broadcasts.

### VK1WI

First broadcast scheduled for Sunday 21st April and thereafter same day and time:

10.00Z 3595 kHz

7140 kHz

148.5 MHz FM

BC Committee VK1VP, IIMP, 2YS/1.

### VK3AWI

11.00 local time Sundays:

3585 kHz AM

7140 kHz SSB

52.625 MHz FM

53.605 MHz AM

145.13 MHz AM

Hunter Branch Mondays 18.00h 80m.

### VK3WI

10.30 local time Sundays:

1825 kHz AM

3800 kHz SSB

7148 kHz SSB

Ch1 FM

(subject to availability at present of relay stations whilst under re-location).

### VK4WI

08.00 local time Sundays:

3580 kHz AM

7140 kHz SSB

14343 kHz SSB

re-broadcast on Ch 8 FM. BC officer VK4HB.

### VK5WI

23.30Z Sunday mornings originating on 1.8 MHz band and relays as follows—

3.815 MHz by VK5ZQ

7.125 MHz by VK5NB

14.170 MHz by VK5ST

52.2 MHz by VK5ZG

Ch 48 by VK5WB

VK5CM in Darwin on 2m

VK5DK in Mt. Gambier on 2m

### VK6WI

09.30 local time on Sundays:

3900 kHz SSB

7080 kHz SSB

14100 kHz SSB

52.056 MHz FM

### VK7

09.30 local time on Sundays originated on

Mt. Barrow 2m repeater VK7RAA and re-

broadcast in Launceston area 3672 kHz SSB,

7130 kHz AM and in Hobart area on 53.032

AM, 144.1 MHz AM, 146 MHz FM and 432.1

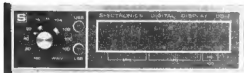
MHz AM.

# SIDE BAND ELECTRONICS ENGINEERING

## YAESU MUSEN TRANSCEIVERS

Prices quoted are with by-law import duties exemption. Firm order must be accompanied by minimum 50% deposit, 3 photo-copies of the amateur station license for the by-law application. Average delay in delivery 6 to 8 weeks.

FT 101 B AC/DC 180 to 10 M and fan	\$525
FT DX 401 AC supply built-in	\$495
FT/FP 200, but in very short supply	\$370
FL 2100 linear amplifiers	\$375
YC 355 D frequency counter, up to 200MHz, only	\$250
FT 101/101B/401/560 CW filters	\$30
FT DX 400/560 noise blankers,	\$20
For YAESU MUSEN FT-101 and FT-101B, 560 and 401 users, a digital frequency read-out counter, made for the YAESU sets but coming from the U.S.A., plugs straight into the transceivers and reads the operating frequency to 100 Hertz measures 8" wide, 3" high and 7" deep with clear LED digits,	\$160



## 144-145MHz Two Metre Equipment

**CLEGG FM 27-B** 25 Watt output 145-147MHz transceivers, independent continuous receiver and transmitter tuning, with by-law import duties exemption only \$350

**BELCOM** Liner 2 20W SSB PEP 12V DC solid state transceivers \$250

**KEN PRODUCTS** KP-202 hand-held 2W output FM transceivers \$150  
KCP-2 NICAD battery chargers & 10 NICAD batteries \$35

**KLM ELECTRONICS** solid state 12V DC linear amplifier, 12 Watt output with 1 to 2 Watt drive, ideal for the KEN KP-202, with automatic antenna-change-over when driven \$50

**YAGI ANTENNAS** 9 element 10 ft. boom, with gamma match coax feed \$30

## MIDLAND PRODUCTS

SWR Meters, 52 ohm impedance, twin-meter type \$16  
same SWR Meters, single-meter type FSM \$12  
PTT hand-held microphones 50K dynamic \$10  
5 Watt CB 23 channel 12V DC operation AM solid state transceivers, complete with crystals for all channels, ideal for future novice licensees. PTT microphone included \$95  
5 Watt AM 15 Watt PEP SSB CB 23 channel transceivers, same comments \$175

## PONY CB TRANSCEIVERS

Model CB-74 5 Watt AM 6 channel capacity 12V DC with microphone \$80  
Model CB-78 5 Watt AM 23 channels, with microphone and all crystals, 12V DC \$95

## BARLOW-WADLEY RECEIVERS

Model XCR-30 Mark 2 portable crystal controlled communications receivers, cannot get enough of them from South Africa, when available \$225

## HY-GAIN ANTENNAS & TRANSCEIVERS

14 AVQ 10 to 40 M Verticals, no guys, 19' tall, needs lots of radials \$45  
18 AVT 10 to 80 M verticals, no guys, 23' tall also needs lots of radials \$65  
TH 3 JR 10/15/20 M Junior 3 el. Yagi, 12' boom 20 lbs weight \$100  
TH 3 Mk 3 10/15/20 M senior 3 el. Yagi, 14' boom 40 lbs weight 1 KW \$145  
TH6DXX 10/15/20 M senior 6 el. Yagi 24' boom 60 lbs weight, 1KW \$175  
204 BA 20 M mono-band 4 el. full size Yagi 26' boom called the TIGER Array and it is a TIGER! \$150  
DB 10-15 10/15 M 3 el. Yagi ideal for use above the 204 BA 25 lbs. \$110  
Mobile Whip 108MHz up, with magnetic hold base, 18' RGG-58U, cable and coax plug \$18  
Mobile Whip, standard base, 12' coax cable & plug \$9  
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Locally made balun \$15

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CDR AR 22R \$40  
HAM-M \$130  
HY-GAIN model 400 roto-brake, \$190  
All with control/indicator units  
New surplus 8 core control cable, \$0.25 per yard.

## NOISE BRIDGES

Omega TE 01 up to 100MHz \$25

**EGG INSULATORS** the old style porcelain eggs, a dozen for \$1.50

## POWER OUTPUT METERS

Galaxy RF-550A with 6 position coax switch \$75  
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**ELECTRONIC KEYS** Kataumi model EK 105 A 230V AC with key paddle \$35

**ASAHI** AS-303 A set of 5 mobile whips, complete with swivel mount, spring, base section, the lot for \$90

All prices quoted are net, cash with orders, basis Springwood, N.S.W. Sales tax included in all cases, prices subject to changes without prior notice. Sorry, no terms nor credit or COD, only cash and carry. Government orders same conditions! Include \$0.50 per \$100.—value for all-risk insurance. Freight, postage and carriage are all extras.

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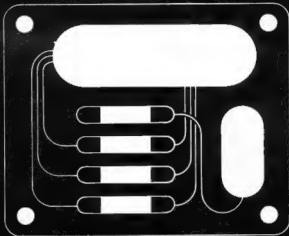
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and lots of  
others, too.**



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For more efficient 2-metre performance use the SCALAR M25. A 3dB gain mobile, designed for use in the 140-175 Mhz band. The antenna is a 5/8 wavelength whip complete with integral loading coil. Constructed of fibreglass these antennas combine resilience with non-ferrous continuity for high quality performance and noise free operation.

### AND SCALAR'S OWN

### "MAGNABASE"

### MODEL MGB



This high quality magnetic base may be fitted with any SCALAR whip. Instant installation on any flat metal surface.

Fully protected for scratch free mounting.

Complete with 12 feet of RG58CU coaxial cable.

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## Hy gain DUOBAND BEAMS

### Model DB-24B for 20 and 40 Meters

- 8.1 db Gain on 20 Meters
- 4.9 db Gain on 40 Meters
- Takes Maximum Legal Power



Uses three full-sized elements on 20 meters and two 2/3 size elements in conjunction with Hy-Gain's perfected linear loading on 40 meters. Unique linear decoupling stubs make two band operation possible without inductance and capacity traps. Antenna feeds with 52 ohm coax and is equipped with balun and Beta Match for optimum energy transfer. F/B Ratio: 20 meters, 20-30 db; 40 meters, 10-20 db. Boom length 24 ft., longest element 43 ft. Maximum input 1 kw, Am. Shpg. wt. 64 lbs.

### AVAILABLE EX STOCK

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Plus Freight

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- Provides accurate Display or Transmitted AM CW RTTY Signals.
- Shows signal envelope, A.F. and R.F.
- Shows receiver I.F. envelope with IF's up to 6MHz.
- Operates 160-6 Metres. 15W - 1kW.
- Trapezoid patterns.
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- Built-In Tone Oscillators.
- 50-75 ohm. Coaxial Input.

\$105.88 incl. Sales Tax

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**RF LOAD  
WATTMETER**  
MODEL HM-2103



- Frequency Range 1.8 to 30 MHz
- Wattmeter Range 0-200 and 0-1000 watts
- Wattmeter Accuracy  $\pm 10\%$  of full-scale reading
- Power Rating 175 watts continuous, 1000 watts maximum
- Overload Indication Thermal switch activated
- SWR Less than 1.2:1
- Load Type Noninductive, solid carbon
- Load Impedance 50 ohms nominal
- Connectors UHF type SO-239

5 $\frac{1}{2}$ " wide x 6" high x 13 $\frac{3}{4}$ " deep

\$105.82 incl. Sales Tax

Ex Stock

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Tel.: 43 5305

# QSP

Amateur Radio is a hobby. An absorbing hobby. A rather special hobby, in that, to participate, one must qualify before participating.

It follows, then, that we must act responsibly to retain our privileges and we must consider our activities in this context.

Yes, Amateur Radio is political. But only in the sense that the corporate body must negotiate with various authorities, both in this

country and other countries, via our international affiliation with IARU.

Internally we should be concerned with those activities which are aimed at enriching our hobby and by being useful to our community, should the need arise.

We must foster the principles of Interstate and Intra-State co-operation as well as International fellowship.

I would like to conclude with the six precepts of the Amateur Code:

*One* The Amateur is Gentlemanly . . . He never knowingly uses the air for his

own amusement in such a way as to lessen the pleasure of others. He abides by the pledges given by the WIA in his behalf to the public and Government.

*Two* The Amateur is Loyal . . . He owes his amateur radio to the WIA and he offers it his unswerving loyalty.

*Three* The Amateur is Progressive . . . He keeps his station abreast of science. It is built well and efficiently. His operating practice is clean and regular.

*Four* The Amateur is Friendly . . . Slow and patient sending when requested

friendly advice and counsel to the beginner, kindly assistance and co-operation for the broadcast listener; these are marks of the amateur spirit.

*Five* The Amateur is Balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community.

*Six* The Amateur is Patriotic . . . His knowledge and his station are always ready for the service of his country and his community.

J. J. Martin VK3TY  
Executive Member

**IARC**  
QST Feb. '74 lists a meeting of the International Amateur Radio Club at ITU HQ in Geneva on July 27th and 28th 1974. If you are likely to be up that way, it will be a technical meeting and for further details contact IARC President, Dr. M. Josephin OK1WI, ITU, Place des Nations, 1211 Geneva 20, Switzerland.

**QUERNSEY GC8**  
A note from VK3APN includes times and frequencies for the rest of 1974 when GC8HT will be on, for 1 hour at a time relevant to VK operators. For June the dates, times, frequencies and modes are:

10th	0800 Z	7043	CW
	0900 Z	7083	SSB
16th	0800 Z	7083	SSB
17th	0700 Z	14013	CW
	0800 Z	14043	CW
	0900 Z	14113	SSB
23rd	0900 Z	14113	SSB
28th	1400 Z	14173	SSB

When QSLing write the month in words. GC8HT prefers direct QSLs to Box 100, Guernsey, G.C. with SAE plus 1/IRC for surface mail reply or 2 IRCs for air mail reply.

## ENERGY CRISIS

"Although large-scale use of wind-driven generators declined in the USA with the introduction of the rural electrification programme in the '30s, there is a revival of interest in alternative energy sources resulting from the threat of the growing energy crisis, several individuals in the US are presently utilising wind-driven generators as their only source of power in the home and are finding it quite adequate". Part of an article in Feb. '74 QST.

## Afterthoughts

Fig. 1 on page 14 of April AR. Total length of antenna is 102 ft, not one leg which should be shown as 51 ft.

**AMEND YOUR COPY NOW!**

In the "Afterthoughts", page 11, May AR, the square root sign on the right hand side of equation 2 should cover 2A only. In equation 3 the square root sign covers the first bracketed section only. The photographs 3 and 4 are back to front and upside down.

## DEPARTMENT OF CUSTOMS & EXCISE Quote 73/7884

April 19 1974

Dear Mr Dodd,

I refer to past correspondence concerning by-law admission of transceivers designed exclusively for amateur radio use.

The situation has been under review for some time and it has now been decided that amateur transceivers may be admitted under by-law without the necessity of producing an Amateur Station Licence.

In accordance with this decision, a reference operating on and from 1 April 1974 is currently being inserted in the Consolidated By-law references publication to provide for duty free importation of amateur transceivers up to and including 28.7 MHz.

While this will cover the bulk of imported amateur transceivers, there are units operating on higher frequencies that will, of course, not be covered. The situation in respect of these is still under review.

However, pending completion of this review, consideration will be given to by-law admission of specific models on receipt of formal by-law applications, accompanied by details of the goods concerned and evidence establishing that suitably equivalent goods are not responsibly available from Australian manufacturers.

Yours sincerely,

R. P. Monck  
for P. A. MURPHY  
Director, By-law Operations

Mr. P. B. Dodd,  
Secretary  
The Wireless Institute of Australia  
PO Box 150  
TOORAK Vic. 3142

## VHF/UHF ADVISORY COMMITTEE

The Chairman of the VIA VHFAC advises the Committee is about to look into the replies to Questionnaires relating to the 6m band. Has anybody anything to submit about this band? If so, it is recommended you write at once to VK3ZPA OTHR. Include your ideas on the 2m band too if you want to. Also any uncompleted questionnaires would be welcome properly completed.

IARU

News has come to hand that the Pakistan Amateur Radio Society has applied to IARU H.Q. for membership. The secretary of the society is M. Noor Khan and the address is given as PO Box 65, Lahore, Pakistan.

## WARG 1978 — ITU GENEVA

Tom Clarkson, ZL2AZ, writing in his Report to NZART for 1973 as published in Break-In for April 1974 stresses the vital significance to the amateur service of the World Administrative Radio Conference scheduled for 1978. He writes "The FCC/ARRL high-level committee in the USA are approaching the task of evaluating all aspects of the Amateur Service. The frequency space it needs, or deserves, is being scrutinised in great detail. This includes the justification for having amateur activity."

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# experiments in modulation and audio

## part four

J. A. Adcock, VK3ACA  
P.O. Box 106, Preston, 3072

Here is the concluding and perhaps most controversial part of the series. If you too would like an analogue compressor, then read on.

### PERFECT COMPRESSION (System 5)

As described earlier, equation (6) represents the complete waveform of an SSB signal. This in simplified form is  $A \sin(\theta + \phi)$  where  $A$ ,  $\theta$ , and  $\phi$ , are as previously defined. If this signal is heavily RF clipped or RF compressed, the result will be  $k \sin(\theta + \phi)$ , that is, the  $A$  or variable amplitude component of the waveform has been removed and replaced by a constant  $k$ . When the signal is heterodyned back to audio, the result is simply  $\sin \theta$  or the original audio with amplitude variations removed.

A similar result can be produced using the analogue computer by dividing the original audio by  $A$  in which case we have . . .

$A \sin \theta / A = \sin \theta$   $A$  is as defined for equation 4.

This process was referred to in system 4. The circuit for carrying out this operation is shown in fig. 11. Note that the waveform produced by this system will not be the same as one which uses audio clipping.

If the audio from this system is fed into the microphone jack of an SSB transceiver, the signal coming out of the aerial terminal will be almost the same as if RF clipping and RF filtering had been used. (9dB advantage has been claimed

for RF clipping in reference 1).

There is one small problem which is easily overcome. With zero signal input ( $A = 0$ ) there is a situation of zero divided by zero at the divider and noise is the result. To overcome this, slightly less than complete compression can be used. This is done by introducing a small offset into the divider. The complete equation will now read, output:—

$$= A \sin \theta$$

$$A + a$$

Where " $A$ " is derived from equation (4) and " $a$ " is a small constant, that is small

is annoying to the listener and should be eliminated if possible.

This system presents a number of interesting possibilities to anyone who wishes to experiment with new ideas. It at least shows there are some new methods of attack on old problems.

The system described presents a new flexibility in generating SSB. For example, by reducing the deviation narrow band, SSB can be produced! In effect, the frequency of the audio produced can be divided by any required factor. For example, by using half deviation, the modulating audio is divided by two and there-

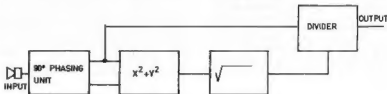


FIG 11 PERFECT COMPRESSOR

as compared with " $A$ " peak.

(This also overcomes the very objectionable distortion that complete removal of the amplitude produces.—Technical Editor.)

### CONCLUSIONS — SYSTEMS 4 AND 5

Tests so far have produced encouraging results. It was found necessary to provide a simple integrating circuit at the input of the system to produce a 6dB per octave roll off above 300Hz. At the time of writing, the need for this is not understood.

Simultaneous amplitude modulation by the envelope has not so far been tried. The signal which is present between speech

and the result would be similar to modulation, by half frequency audio, from system 3. Also suitably reduced deviation can be used before feeding the signal into a varactor multiplier. For example by division of the frequency component's by three and heterodyning to 144 MHz an SSB signal is produced that may be successfully tripled in a varactor circuit to 432 MHz. Result is good quality UHF SSB.

The compressor system was undoubtedly the simplest of all to get going and the results are very effective. The actual construction of a unit to perform this function is not a difficult job — don't be frightened by the use of the term computer. The whole unit could be built on a PC board with several trimmers for offset adjustment. Four "four quadrant multipliers" are required for about \$4 each. The rest of the circuit consists of several operational amplifiers and a number of conventional components.

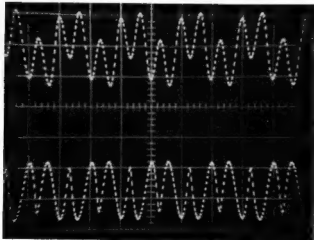
On a predesigned PC board, it should be much simpler than building an extra filter into an SSB rig. If none of the other systems appeal I am sure this one will.

The author would appreciate contacts with anyone interested in developing the subject further. He is active on 1.8, 7 and 144 MHz but can use most modes on all bands up to 144 except 52 MHz. Anyone interested in demonstrations of the system can make a sked by writing or telephone.

The author would like to thank Dan Van Eiken, VK3UJ and several others for their assistance in carrying out on-air tests.

### References

- 1 QST Jan. 1986
- (Note systems 2, 3, 4 and 5 have been covered by provisional patents.)



PHOTOGRAPH 5. OPERATION OF THE ANALOGUE COMPRESSOR. Horizontal Scale: 1 division = 1 ms. Upper Trace: Two tone audio input. Lower Trace: Compressor output.

# Further ideas on the Ubiquitous G5RV

PHIL WILLIAMS, VK5NN  
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Rosslyn Park, S.A., 5072.

The article in January 1973 *Amateur Radio* by the originator of this famous antenna was extremely interesting, but there are a few further points which have resulted from re-locating my station from a quiet semi-rural QTH to an urban situation which is much more noisy.

These modifications concern the low impedance feeder from the Z match to the bottom of the 300 ohm feed-line, and a method of feeding and matching the antenna as a top-loaded vertical for 160 metre operation.

The usual form of the G5RV is a 102 ft centre-fed flat-top antenna, which works best when at least 30 ft high. Even the G5R-inverted-V works well on a single central pole. The central feeder is usually a 20 metre half-wave resonant piece of 300 ohm or open wire line which it pays to grid-dip before erection by shorting both ends, stretching out full length and grid-dipping to say 14 150kHz. From the bottom of this to the transmitter or Z match (which should always be used with a multi-band

former at 350 watts and high SWR, and the open wire line is sometimes unsightly in the house.

The twin lead used was twisted polythene coated copper wire from discarded multi-core telephone cable. The wire was designated 20 lbs per mile or about 20 SWG. A balanced quad was also tried connecting diagonally opposite wires together, but little improvement was noticed. About 30 ft of the twisted line showed no sign of distress with 350 watts pep SSB. Black

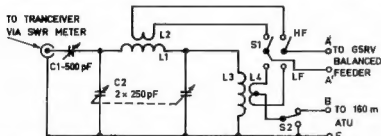


FIG 1 MODIFIED "Z" MATCH - ORIGINAL FROM RADIO COMMUNICATION

HANDBOOK R5GB P13-37 FIG 13-60

aerial) it has been usual to employ coaxial cable of 50, 70 or 100 ohms impedance.

This is fine for transmitting but the outside of the coax cable picks up more noise than I wanted to hear, and much of this is transferred capacitively to the Z match tuned circuits from the link. The 80 and 40 metre bands were worst affected in this regard.

Remedies for this were firstly to replace the coax cable with balanced feeder such as lamp flex, Telcon 72 ohm twin-lead, or a low Z balanced quad line, and secondly to earth the centre tap on the low frequency link on the Z match. A third remedy, after the implementation of the former, was the fitting of a cylindrical Faraday shield between the coils. However, this provided only marginal, though measurable, improvement.

In his article in *Amateur Radio* for January, 1973, Page 7, Louis Varney mentions the use of 70 ohm twin lead or the use of 83 ft of 300 ohm line directly to the ATU. However, I had fears about operating the

PVC tubing was pulled over the twisted pair as a weather and ultra-violet light shield where the feeder is in the open.

Noise varies with time and weather but, typically, the above measures reduced S6 or 7 levels to less than S3. The Faraday shield resulted in a further reduction of about 8db or 1S point, but did not make any great difference to readability of signals on 80 metres.

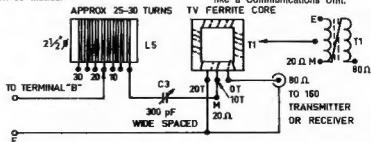


FIG 2 ANTENNA TUNING UNIT FOR 160 METRES

Fig. 1 shows the general arrangement of the G5RV and Z-match. The additional switches shown are well worth-while. S1 enables the antenna to be switched to L2 for 10, 15, and 20 metres, or to L4 for 20, 40 and 80 metres, and saves having to jump up to unplug or operate on terminals. The other switch, S2, enables the antenna to be fed against ground for 160 metre operation. A good earthing scheme is needed, such as stakes, radials, etc., but this will not be elaborated on here.

The centre point of the link L4 is a convenient point for feeding, and both 180 metres on a receiver and another band on the transmitter may be monitored at the same time, but it is inadvisable to energise two transmitters into one aerial.

The suggested method of feeding and matching at 160 metres is shown in Fig. 2. Looking into the resonant antenna via L5 and C3 at point M with a noise bridge, for a typical G5RV at about 30 feet height, a radiation resistance of about 20 ohms is measured. The transformer T1 consists of a TV timebase ferrite core (2 sections forming a square loop) with 20 plus 10 turns (bifilar wound) to give a 4 times impedance step-up to 80 ohms, into which the transmitter pi-network loads happily.

Select a tap on L5 which permits C3 to tune 1815 kHz when near maximum capacitance. C3 may be calibrated for 1875kHz for receiving ZL CW stations and up to 2000kHz for other DX as required. This tuning is useful for reducing BC station overloading of the receiver front end and the resulting beats and harmonics. L5 is a coil of about 25 turns 2½ inches diameter tapped every 5 turns or so. C3 is a transmitting type capacitor of about 300 pf, with widespread plates mounted on insulators well clear of the chassis or box and with an insulated drive coupling. I trust these notes may be of value to those 6-bands-on-one-antenna men, whose band-changing must all be done in the shack, and whose homes must not look like a Communications Unit.



Conversely, a rise in the applied frequency causes X to become negative with respect to ground.

#### CONNECTION TO RECEIVER

Leave this portion of the circuit for the moment and pass to that portion associated with the receiver. It will be seen that a diode is coupled via Cx to the hot end of the receiver HFO tank circuit. It will also be seen that a reverse potential ( $\pm 4V$ ) is applied via two 100k resistors in series. This potential was chosen as that which causes the particular diode (OA202) to assume a capacity near the centre of its useful range, which rises or falls with a change of applied potential.

Cx which couples the diode to the tank circuit must be chosen by experiment for a particular receiver, and should be as low in value as will provide adequate frequency control, and at the same time not disturb receiver calibration more than a minor amount. In those receivers doctored by the author, the highest capacity used was 2.2 pF. In some instances sufficient control was obtained by winding two or three turns of solid pvc covered hook-up wire around a lead associated with the hot end of the HFO. Needless to say, the diode and its associated components should be mounted as close as possible to Cx and made quite rigid in mounting. The lead from the .01 capacitor to the AFC unit can be any convenient length and an earth return between the receiver and the AFC unit should also be included.

To assist in the choice of Cx, the following symptoms will be exhibited for incorrect value. (i) Too high value will result in over control of the receiver and will be manifest in the receiver hunting, (an effect brought about by the relatively slow time constant of the RC network associated with the rectifiers). (ii) Too low a value will result in too great a lag in correction of HFO frequency, or no correction at all.

It is conceded not every ham wishes to disturb the innards of his costly transceiver and this was the main reason behind VK3PB's resort to the mechanical and totally external AFC unit. However, many commercially produced ham transceivers have a clarifier facility which controls receiver frequency without disturbing the transmitter. In many cases the clarifier control changes the potential applied to a Varicap diode, in which case a facility is already available which could be controlled by potentials developed by the AFC unit. Perhaps some enterprising ham may care to investigate this.

The only difficulty liable to be encountered in construction of the AFC unit would be the filters F1 and F2. In the author's case the Inductors are a nominal 300mH wound on Ferroxcube adjustable pot cores type LA2400. The parallel capacitors are Styroal 0.02 uF of 1% tolerance, and the coupling capacitors 470 pF ceramics. Choice of the Styroal capacitors lies in their temperature co-efficient being opposite to the pot cores, thus resulting in good

frequency stability over a large range in ambient temperatures. The particular pot cores used are probably no longer available, but a substitute may be the Siemens Type 185T2 - N22 having dimensions 22 x 13. Winding details for particular values of inductance are available from the manufacturers.

#### ADJUSTMENTS

Adjustments to the AFC unit are facilitated by the metering. This is an essential part of the unit as it provides a continuous visual means of monitoring any drift which may occur away from the 2125Hz mark units during reception of the RTTY signal.

Before switching on power to the unit, see that the full scale adj. potentiometer shunting the meter is at its lowest value; this ensures no damage to the meter during preliminary adjustments. Next disconnect the 100k resistor between X and Y, open SW1, remove V3 from socket, switch on power and turn the full scale adj. control to obtain a full scale reading on the meter. Replace V3 and after allowing a warm-up period set the centre zero adj. control to obtain exactly half scale deflection. This reading is the result of the standing  $\pm 4V$  bias. Short circuit point X to ground and note the meter returns towards full scale. Remove the short circuit from X, the meter should return to centre.

With the 100k resistor still disconnected again ground point X. Switch off power and adjust the moving arm of the DC balance control to the point where it is resistively centered. Close SW1 and re-apply power. Connect a source of audio to the input. This can be either an audio frequency generator or the receiver itself. The object being to apply a frequency which corresponds to the centre of the mark filter in the TU and which may be varied either side of that frequency. A simple means of doing this is to apply a netting signal to the receiver and adjust tuning to the point where a heterodyne provides the mark frequency. With a low level output from the receiver (the minimum level the TU will operate from), apply a VTM or a high resistance multi-meter between points A (positive) and X (earth), and vary the input frequency to obtain a peak reading on the meter. If the peak appears broad, adjust the Audio Level control until a relatively sharp amplitude peak is obtained as the signal is varied through resonance of the filter. Note the value of the meter reading.

Transfer the meter to point B (neg.) and X (earth) and vary the input frequency above the nominal centre frequency noting any difference in DC amplitude from the previous reading. Any discrepancy should be corrected by means of the Audio Balance control. A minor discrepancy of say 5% can be tolerated. Beyond this, steps must be taken to provide a better balance which can usually be done by applying a capacitor across the cathode circuit of the half of either V1A or V2A which exhibits the lower amplification. An important part

of these adjustments is to allow sufficient time for the DC potentials to stabilise because the time constants of the 125 uF capacitors introduce a lag. A final DC balance is obtained by the adjustment of the DC balance control to the point where zero potential exists at point X when the applied frequency corresponds to the centre frequency of the mark filter in the TU.

Replace the 100k resistor between points X and Y, but leave the lead to the varicap in the receiver disconnected. Open circuit SW1 and check that the meter still reads centre scale, then close SW1 and vary input frequency either side of the mark frequency. At the peak frequencies of F1 and F2 the meter should read zero and full scale. A minor adjustment may be needed to the meter adjusting controls, but the important thing is that when the input frequency corresponds to the centre of the mark filter in the TU, the meter should return to a centre reading.

Connect the lead to the varicap in the receiver and slowly trim the receiver either side of a signal supplying an output frequency corresponding to the centre-mark frequency (2125Hz). Watch the AFC meter move either side of centre, due to variations of the audio output frequency not more than about 5Hz. As the frequency is moved away from the mark frequency, the meter will reach full scale or zero and then return to centre scale. This indicates that control has been lost.

A condition which may arise when the foregoing tests are being made, particularly if the receiver employs two mixers (double superheterodyne) is exhibited by the receiver refusing to lock in on the mark frequency. This is easily overcome by reversing the grid connections to V1B and V2B.

#### OPERATION

When tuning to a RTTY signal leave SW1 open and use the normal tuning procedure. When print out is satisfactory, close SW1. If the receiver is exactly tuned the meter will indicate a centre scale reading. If not, trim the receiver until a centre reading is obtained. Thereafter, any drift will be indicated by the meter and from time to time, the receiver may be re-tuned to maintain a centre reading. This trimming will not change the audio output frequency if done slowly. With experience, the meter will indicate if the signal has drifted high or low and thus the appropriate direction for re-tuning.

The long time constant of the DC filtering network provides a sufficiently constant potential to be maintained at point X during normal RTTY transitions between mark and space units. The TC is short enough to allow tracking of a normal slowly drifting signal.

The power supply is not discussed as it may be a conventional supply delivering about 250V HT and 6.3V AC for heaters. Component layout is not important in the AFC unit, nor is shielding as it is not operational during transmission.

# VK6IZ Double Inverted Vee

more gain for less money

K. KHUEN—KRYK, VK6IZ

Unit 32, Harbour Heights,  
East and George Streets,  
East Fremantle, 6158

Many amateurs find that twenty metres requires a better antenna than just a dipole and are perplexed as to how to get more signal. Here is a solution that will give good results and cost a minimum to build.

A beam costs about \$200 and a quad over \$100. Then there is the problem of what to hold it in the air with. A tower is the most popular device, ranging in price from perhaps \$50 for a used tower up to many hundreds of dollars, depending on the type desired. The more expensive types might be crank-up, non-guyed (with tilt over action). Of course a heavy duty rotator such as a Ham M costs around \$130 plus cable, freight, etc., and the cost never seems to end.

This antenna, which may also be built for other bands if desired, is known as a **double inverted vee**, gives good directivity and power gain in the direction chosen, but also allows signals to be heard and worked from the sides and back. Construction is relatively simple and cost can be held to a minimum depending on how it is constructed. The antenna will give a much lower angle of radiation and thus a better signal to DX areas not normally workable with simple antennas such as a dipole.

When finished the antenna looks like the outline of a tent, Fig 1. The tower this antenna is placed to the ground the shorter the elements become due to ground effects. This can be determined by experiment with an SWR meter and cut and try, the easiest method being to allow a foot or two of the element to hang down beyond the end insulator, where it may easily be trimmed. This saves unfastening insulators each time. Fig 2 shows how the connections may be made at the feed-point. Alternatively the elements and co-ax may be soldered together at the appropriate points using egg insulators or similar supports. Theoretically a 1:1 balun should be used at the feed-point, but it does not appear to make much difference.

The antenna will work well with 75 ohm co-ax but the SWR will be slightly higher, although not excessive (less than 1.5 to 1). With 52 ohm co-ax SWR should be near unity, depending somewhat on height and surrounding objects.

If no co-ax is available a twisted pair of wires will serve the same purpose as

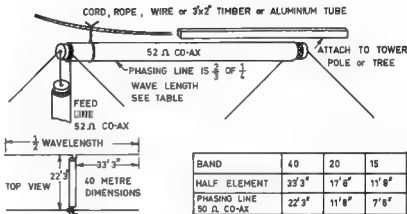


FIG 1

72 ohm co-ax and should substitute quite nicely. Another possibility is 75 ohm twin lead, which will make the whole structure lighter.

For the adventurous, more elements (up to 6 or so) can be added for higher directivity and gain. Element ends are insulated and tied off on bushes, trees or stakes in the ground. The beautiful thing about this antenna is that it is highly transportable, fitting into a box when travelling to a field

day site and easily erected in a matter of minutes in emergency conditions. Note when more than 2 elements are used the element length, co-ax length, and spacing are exactly the same. Just add them on.

BAND	40	20	15
HALF ELEMENT	33'3"	17'6"	11'8"
PHASING LINE 50 Ω CO-AX	22'3"	11'8"	7'6"

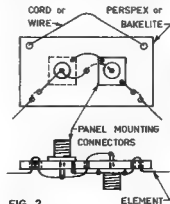


FIG 2

## CLUB/ZONE/DIVISION NEWS

• The Publications Committee wishes to advise that the call on AR for space to print material is so great it is not possible to include a section devoted to Divisional, Zone or Club news.

• Arrangements were made with all Divisions that such news would appear in Divisional Bulletins if so required, and accepted by Divisional Bulletin Editors. Bulletins, when submitted, are carried as inserts in AR mailed to members of the Division concerned.

• It has been agreed however that AR should include an Events Diary to contain very brief details of forthcoming events. Items for this Diary MUST reach the Editor not later than the 1st of the month prior to publication.

# History of a Repeater

## GOLD COAST RADIO CLUB

P.O. Box 288,  
Southport, Queensland, 4215.

Following many discussions with a handful of repeater minded local Amateurs, the "Gold Coast Radio Club" was inaugurated and affiliated with the WIA, Qld. Division, on 19th October, 1985 for the express purpose of constructing and installing a 2 metre FM Repeater in our area.

Prior to the forming of the Club a couple of us had, in fact, already constructed and tested a working repeater. When the PMG Radio Branch was asked for an experimental licence for actual air testing of the unit we were told that only the WIA or a bona fide group affiliated with the WIA was eligible for such licence.

Shortly after the formation, and necessary affiliation of the Club, application was made through the WIA to the PMG for a permit to operate an experimental repeater. The PMG Permit was issued on 18th Jan., 1970 (the application was dated 24th Nov. 1969) for a period of three months only.

The Repeater had actually been installed and commissioned, on a site on Mt. Tamborine, by 14th Dec., 1969 and had been operational from that date. The equipment in use, at this time, was a PYE PTC8702 25 watt Base Station. The Tx and Rx were separated by some 200 yards and were connected together with a 600 ohm audio and control line. Aerials in use were 5 half-wave elements fed in phase, vertical Colinears, approx 40' above ground. Coverage from this original setup was very good considering the desensitisation problems encountered with the small Tx/Rx frequency spacing. The Tx was on Chan. "C", 146.145, and the Rx was on Chan. "A", 145.854.

After a couple of months operating under these conditions a permanent licence was applied for, along with a frequency change to "Repeater Chan. 1", 146.1 input and 145.8 output. The licence was issued by the PMG on 8th April, 1970 with the call-sign VK4EI/R2. Two months prior to the issue of the licence (Feb '69) a new solid state, home brewed Rx was installed, in lieu of the old PYE valve unit, and the "A" and "C" frequencies were changed to the new "Ch. 1". With this setup (500kHz separation) and a more sensitive Rx the range of the repeater was much improved. At this point in time the Rx range outdid that of the Tx and a new 50 watt Tx was contemplated to replace the 25 watt unit then in service. Solid state design was looked at but lack of finances (power transistors for VHF are pretty expensive) put our sights back on to a valve device. We were lucky to find, in very good order, a Philips 1674, 50 watt Base Station for \$20. After removing the Rx section from

the base station and incorporating the necessary modifications the 50 watt Tx was put into service during June, 1970.

The site on Mt. Tamborine, 12 miles west of Southport and 40 miles South-West of Brisbane, had an elevation of 1600 feet and, with the now updated equipment, the range of the repeater was all that could be expected. If you have a look at a map of S.E. Qld/N.E. N.S.W., you will get some idea of the coverage, as follows:

Mobile/Mobile contact was possible between Lismore, Gold Coast, Brisbane, Toowoomba, Nambour, Maroochydore and most points in between. There was hardly a location in the Brisbane area where a 10w mobile could not be heard by the repeater, and vice-versa. The whole of the Pacific Highway between Murwillumbah, in the south, and Brisbane in the north, was completely covered, with good signals all the way. The Bruce Highway between Brisbane and Nambour was a little patchy but, none the less, usable all the way. Travelling the Cunningham Highway between Brisbane and Warwick the Repeater was loud and clear until one got 5 miles south of Cunningham's Gap. To coin a much used phrase: "She was a little ripper".

Up until this time the repeater was sited on an Amateur's property and was looked upon as a "manned station" and therefore fancy control gear, lockouts etc., were not required by the "Department". Even automatic station I.D. was not mandatory. A solid state keyer was, however, under construction. This was looked upon more as a "status symbol" rather than a necessity.

Everything was going fine with our repeater until March, 1971, when the "Rot" began to set in. During March, 71 a tropical cyclone, "Dora" by name, very unkindly wiped out both the Tx / Rx aerial systems and the repeater was off the air for some two months while new masts and aerials were organised.

The repeater site was subsequently changed and the repeater was off the air for another three or four months while suitable accommodation was found. During Oct./Nov., 1971 the equipment was resited at another site on Mt. Tamborine. Co-inciding with the sighting the now fully operational I.D. unit was installed.

The new site was below the elevation of the original and coverage of the repeater was very much reduced from its new location. The usual contacts with Brisbane Mobiles were now a thing of the past, much to the dissatisfaction of all concerned. This situation continued, everyone getting used to the reduced coverage, until August, 1972. At this time our Trans-

mitter decided to blow up, all of its own accord. The power transformer was demolished along with the QQEO6/40 PA valve and other expensive components and so was taken out of service for much repairing.

After many discussions amongst ourselves, it was decided not to repair the old Tx but to raise some money to purchase a new one. A beautiful Solid State new one! The Club now issued Debenture Stock. With this, and many donations we managed to raise \$1500!! This was far and above all expectations and it was decided to put all this good will towards not only a new Tx but a completely new repeater system.

Around this time two members of the Club purchased, between them, a block of land on Mt. Tamborine. This land was offered to the Club as a new site for our new repeater, which, needless to say, was very gratefully taken up. Investigation, radio range wise, of the site found it to have even greater range than the original location. We were elated and the long, hard haul of dealing with local Council Authorities, and the like, was initiated.

Meanwhile, Philips 1680 equipment had been purchased, along with cavity resonators, power supply, battery, 100' mast, coaxial cable and commercially built aerials. Oh! What a beauty!!

Technical work was carried out on the new project by the pioneers of the old one, Ross VK4ZFD and Mike VK4ZDA while some of the others fought with the local bodies and the drawing board on the Political and Building sides of the project.

Work on the equipment was completed long before any headway had been made with the local Council and our new repeater was air tested from local sites in Brisbane and later on the Gold Coast. It worked like a charm. The built-in time delays, callign initiation, battery telemetry, etc., required a few modifications of the original design for reliability of operation. Once this was accomplished we felt we had the best repeater system in Australia ready for installation. Anyway the equipment was now locked away in a cupboard pending the result of the battle now raging on the Political front.

At long last, in May, 1973, the Shire Council concerned issued the long awaited "Use of Land" and "Building" permits. Work commenced on the preparation of the site almost immediately. Mast and building foundations were put down, requiring much excavation and the pouring of five yards of concrete, all by hand, and a fence was erected around the whole property. Timber, fibro wall sheeting, T&G flooring and other building materials were purchased and erection of the Shack was

started Everything was now running smoothly and the project was expected to be complete and operational by December, 1973.

In August, 1973, for personal reasons, the new site was no longer available as a location for the Club's repeater, and the construction work had to be terminated.

The present situation with VK4EI/R2 is a completely operational, solid state, repeater, worth some \$1500 locked away in a cupboard awaiting a site for its installation. Needless to say, an all out effort is presently in action to acquire yet another

location for the Gold Coast Radio Club's 2M Repeater. Obviously, with so much money invested, the project will never be shelved or forgotten even though the organisers of the project have been close to "throwing in the towel" on more than one occasion. As soon as another site is available VK4EI/R2 will live again!

Perhaps other groups contemplating a repeater project can learn something from our past experience. Our feeling now is forget the equipment side of such a project until the political battle has been fought and won! It would be better, by far, to

have a permanent Repeater Site well and truly tied up before any money or effort is expended on equipment. The technical problems with getting a Repeater operational, even though not an easy task in itself, is far, far, easier than the problem involved in locating and retaining a permanent repeater site.

The moral of the story is: do not rely on verbal agreements. Put aside some of the Repeater Budget for legal assistance in drawing up a contract or binding agreement in respect of the property involved in the project.

# Some thoughts on mobileering

S. C. Fletcher, VK2ASF  
Melling St., Eden, 2551

This is one of the most fascinating branches of our Hobby and has been indulged in by a large number of amateurs.

Over the years, Mobile Equipment has evolved from crude and mostly cheap junk — through the post war years with some better class from disposals, and some home brew but, in the main, far from satisfactory.

Today, with the advent of Single Sideband together with VOX, and super selective receivers, the situation has changed radically. The impossible has happened, and happening every day — DX while driving along in your motor-car with your wife beside you and the back seat full of kids.

My first entry into this fascinating field of "Mobile", was in 1948, so I am not a new comer. Having just completed a 2,000 mile mobile run, I experienced several operational procedures, and it is these which prompt me to offer these few notes for mental digestion.

When contacting a mobile station, never forget while you are in the comfort of your lounge, the mobileer has quite a different kettle of fish. He has all the accoutrements of driving a motor-car, together with observing all driving conditions, watching road signs and the general safety of his passengers. So please let's make it easy for him. This, in the main, is what happens, but unfortunately it does not always apply.

I recently heard two gentlemen openly deride a "mobile", for saying he was "stationary mobile".

Now let's get this cleared up once and for all. The word "mobile" refers to equipment placed in a vehicle, which is capable of moving from place to place under its own power. The word mobile does not in any way infer that the vehicle is moving or doing anything else. It is simply to designate the type of station, and to distinguish the operation from the home licensed station. The main requirement is that the "mobile" indicate his position — this is most important. And further, I say that if the "mobile" is not moving,

then he indicate this fact by stating that he is "stationary mobile". This is information to the receiving stations generally. The two gentlemen(?) previously referred to for deriding a "mobile" don't seem to have a clue in these matters, and I personally object strongly to this type of thing. The mobile station was so embarrassed he didn't know whether he was "mobile", portable or what. This kind of behaviour in the amateur fraternity is deplorable and is only one more blot on the copy book of Amateur Radio.

If you are one of the long-winded type forget it. I had the unhappy experience of having my ears belted for a distance of eight miles along the road without a break — a painful experience. This is ear-bashing at its best (or worst). Also for the initial call to a mobile please give your call sign distinctly, making full use of phonetics. This makes the mobileer very happy.

I have heard home stations "talk over" the mobile, with comments in which no one is really interested. This of course is a deliberate breach of regulations and should be dealt with accordingly, apart from being an embarrassment to the mobileer. As far as reporting goes, please always give an accurate report. Don't give a jizzed up report in an effort to raise the "mobile's" ego, he is not stupid you know.

Another nice courtesy is — if and when a mobile says "wait" or "standby" then do just that — as he may be turning a corner, passing a vehicle, or just being careful, so please don't jump in and start talking. This is an embarrassment to the "mobileer" and is operating procedure at its worst level. There are many more points I could mention but I will leave it at that. All these little points make for happy "mobileering" and allow us to enjoy our hobby to its full.

The mobileer has gone to a lot of effort (and expense) to make his equipment work well. He is very proud of it and loves every minute, so let us all endeavour, at all times, to make his lot a happy one.

## Design of Normal-Mode Helix Antennae

R. J. F. GUERTLER  
Antenna Engineering Aust. Pty. Ltd, Kilsyth

This article first appeared in the Proceedings of the IREE, January, 1972. It is represented here in a summarised form.

Design equations for short helical vertical antennae have been derived by A. G. Kardolian and W. Sichak, however these are inconvenient for the average designer (and amateur radio operator). For the case where the height of the helix is very much smaller than the operating wavelength we obtain two useful equations.

The basic design equation is:

$$n = \frac{30}{f \cdot d} \left[ \frac{h}{d} \right]^{1/2}$$

where  $n$  = required number of turns of wire  
 $f$  = operating frequency of antennae in MHz,

$d$  = diameter of former that wire is wound on in metres,

$h$  = overall height of helical antenna in metres.

The approximate length of the wire,  $w$ , in metres, may be found by the equation:

$$w = \frac{30 \pi}{f} \left[ \frac{h}{d} \right]^{1/2}$$

This reduced to:

$$w = \frac{94.5}{f} \left[ \frac{h}{d} \right]^{1/2}$$

where the symbols have their previous definitions.

When a tapered fibreglass whip is used,  $d$  should be the mean diameter in metres.

To allow for inaccuracies due to the approximate nature of the formulae, 5 to 10% more turns should be added to the whip initially. Turns may then be removed until resonance occurs.

If desired, the antenna may be set up for one frequency, say 7.35MHz, and made to resonate at a slightly lower frequency, say 7.27MHz, by the addition of a length of straight rod or wire to the top.

A matching network or transformer will be necessary if a 50 ohm load is required.

The choice of wire size is left to the individual. To prevent corona discharges, the top end of the whip should be smooth and free from sharp points or edges—Technical Editor

## an AR special

# The 1974 Easter Federal Convention

The admission of the ACT Division into the WIA had been discussed and apparently agreed at the 1973 Convention. When a postal vote was circulated in March merely to formalise the entry one Division invoked the Article 44 veto thus ensuring that the matter had to be raised at the 1974 Convention. The NSW Division felt very strongly that the admission of such a small group must be preceded by the finalisation (a) of the whole question of the proportional (or weighted) voting powers exercisable by the Fed Councillors of the larger Divisions and (b) the satisfactory acceptance of the extra costs which would accrue from the attendance of an additional Fed Councillor at Conventions.

Almost as soon as the Convention was formally opened it dissolved into a Committee of the whole to consider the ACT Division question and at one stage listened to a play-back of the relevant part of the tapes recorded at the 1973 Convention to refresh memories (and obviate a proposed amendment to the Minutes thereof). After discussing a vast range of relevant material the formal session re-convened, a vote was taken, the ACT Division were admitted with effect from 1st April 1974 and the ACT delegation, having been previously accredited (when 4 out of the 8 Divisions had voted in favour of their admission and prior to the receipt of an Article 44 veto) took their place at the Conference table. It was then formally agreed by all delegates that they and the ACT Division would accept and abide by the Agreement of 29.6.1971 until proper accession to it could be done.

During the Convention various working Committees were set up to examine and report back on a number of difficult matters. Time ran out during discussions on the relative Committee's report on proportional voting and this remains to be resolved. The majority in this Committee favoured — (a) normal one for one voting, (b) where two or more Divisions declared a specific agenda item to be of major importance a referendum of all qualified (to vote) members be held and the result to be binding on the Council — Queensland emphatically adhered to the principle of one vote per Fed Councillor — and (c) a rider that the proposal in (b) could not be made on any future alterations to this (proposed) policy.

The Committee considering the application of Article 44 eventually produced a time schedule in diagram format which was accepted subject to being drafted into a suitable form to amend the Constitution. This specified a full 30 day discussion time before Article 44 could be invoked by two Divisions.

The Committee examining an Agreement between the Divisions on membership

boundaries came up with many useful amendments to the draft including a clause stating that appropriate Divisions may agree that in an area in one Division (State) the members can belong to the other Division. Another clause stated that by appropriate Divisional Agreement a person could elect to become a member of a Division other than the State in which he is resident. Any member transferring overseas continues membership in his 'home' Division unless he resigns.

The acceptance of a 'Position Paper' from the Victorian Division and detailed discussions thereon occupied a considerable amount of time, including an almost unprecedented change of ruling by the chair to admit the paper. The Victorian delegation had taken strong exception to the non-acceptance of the paper, had withdrawn and were re-admitted after learning that the paper would, after all, be accepted as an Agenda item even though it would have been taken as a Special Business item anyway. The entire incident arose because whilst the Agenda item (moving that a 'Position Paper' be received and incorporated in the Minutes) was constitutionally received more than 30 days prior to the Convention, the 'Position Paper' itself was not received until 12 days before the Convention. The paper evoked lengthy discussions in Committee on the questions of the EDP programme (it was agreed that improvements were necessary in the EDP accounting sphere), the work of Executive as Directors of the Company (improved management techniques throughout the WIA were required), Executive office (aspirations on Executive were countered by overworked office through volume of business and poor EDP systems — both are under intense current examination), costs of the Executive (remedy is through budget approved by Council) and methods of representations to Authorities by Executive (Council unwise to tie the hands of its Executive).

The budget and financial matters were debated in depth. Councillors required greater detailed analysis in future. Executive's budget covered the expenses of printing and distributing AR, the costs of the Executive office and various other minor items all of which were subject to inflationary trends. Unable to provide for deficits indefinitely because of cash flow problems. It was finally agreed with great reluctance that the Federal element of subscriptions would have to be raised in 1975 from the existing \$7.20 to \$9.80 per member per annum which included a 10c increase in the IARU element to allow for WIA representation at Region 3 Conferences, etc. The increase also included the costs of Conventions which previously were pooled and paid out of Divisional funds on a membership pro-rata basis, it

having been recognised for many years that far distant small Divisions could not otherwise afford participation in a Convention for the expenses of its delegate. The investment of the \$7000 ITU Fund in Commonwealth Bonds was ratified.

Other matters discussed included —

- ☐ Annual Reports, evoking detailed debate and thanks to all the volunteers involved;
- ☐ Call Book, so that Divisions could economically buy extra quantities over and above normal requirements, if a free issue to their members were desired;
- ☐ Subscriptions billing on an anniversary or cyclic basis in conjunction with the EDP accounting improvements;
- ☐ EMC — essential for all to co-operate in this most important field;
- ☐ The WIA fully supports IARU and IARU Region 3;
- ☐ PMG Handbook revision, Executive was supported;
- ☐ Exec. to approach APO —
  - (a) allow RTTY Ident. in same mode of transmission;
  - (b) separate-series call-signs for WICEN stations;
  - (c) withhold re-issue of Y and Z calls for 12 months if requested by full 'call-sign' amateur concerned;
  - (d) near miss passes in CW to qualify for Novice Licence;
  - (e) that examiners identify by photograph with applications;
- ☐ Contests — RD Contests — working through repeaters disallowed, VK1 a separate Division.
  - CW to CW to count double.
  - P2 stations may enter as though they were VK9s.
  - VK4PJ perpetual trophy for participants in official contests accepted with acclamation
- ☐ Advisory Committee members to serve for 2-year period, half the Committee retiring each year
- ☐ Exec. to examine —
  - (a) Purchasers of transmitters to produce licence to transmit;
  - (b) Convention Agenda items circulate well in advance and print in AR;
  - (c) If membership tokens can be done through EDP for Divisions;
  - (d) Methods of selling AR on book-stalls.
- ☐ Representation by geographic areas of Divisions by own Fed Councillor at Conventions — long term policy item.
- ☐ YRCS —
  - (a) Committee to re-draft YRCS Constitution;
  - (b) State YRCS organisation to operate under proper Constitutions;
  - (c) Each State Supervisor to make Annual Reports with accounts to the Div. Council.



- A beacon policy to be formulated;
- 432 MHz band plan needed;
- Divisions feed regular information to Fed Public Relations officer

The 1975 Convention was set down to be held in Victoria over the Anzac Day holiday

As this short report is necessarily highly condensed any member wishing to have further details on any particular item should contact his Federal Councillor

## THE EXECUTIVE'S REPORT TO FEDERAL COUNCIL (1973)

Gentlemen,

It gives me pleasure to present the report of Executive for the period May 1973 until March 1974.

In commencing this report I would be remiss if I did not make mention of the untiring work carried out for the Institute by the Immediate Past President Michael Owen VK3KI who held office for the last four years. I am happy to say Michael accepted the position of IARU liaison officer — a job for which he is well suited, with his countless international contacts.

### 1. MEMBERS OF THE EXECUTIVE

At the 1973 Convention the following Executive members were appointed. David Wardlaw VK3ADW President, Bill Roper VK3ARZ, Editor, Jack Martin VK3TV, Keith Roger VK3RD, David Rankin VK3QV and Kevin Connolly VK3ARD.

At the first meeting of Executive for the year Jack Martin was appointed Vice-President and Keith Roger Treasurer.

During the year Bill Roper had to stand down as a member of Executive. This was because in the re-organisation of the magazine it was decided that the editor should be paid an honorarium and under the Constitution this made him ineligible for membership of the Executive. I will make further mention of this at a later stage in the report.

John Bennett VK3ZA was appointed to the position of Federal publicity officer during the year, and as you can see by his signature under a number of GSP in "Amateur Radio" he has been able to give us some valuable help although not as much as he had hoped as illness in his family curtailed his activity during part of the year.

John was co-opted to Executive to fill the vacancy caused by Bill Roper's resignation.

Also in regular attendance at Executive meetings were the Project Australia Chairman David Hull VK3ZDH and the VHF/UHF Advisory Committee chairman Peter Wollaston VK3ZPA. We also had visits from Federal Councillors and Councillors of several Divisions.

### 2. EXECUTIVE OFFICE

In reporting on the Executive office I would like to pay tribute to Peter Dodd for his loyalty and untiring work on behalf of the Institute.

For reasons of economy we are forced to operate from a very small office. This helps to compound our problems as during the year we have had changes in clerical staff necessitating re-training each time. There is one distinct need in the office which I would like to draw to your attention and that is the requirement for document copying of a more modern nature. No capital funds are available and consequently the old and expensive methods and machines must continue to be used.

Since the formation of the Federal Company together with the Centralisation of records in the EOP system, the nature of the Executive Office has become very much that of a business office and to that end it is virtually essential that a strict routine be maintained on all financial matters.

### 3. EOP

To enable the Secretary Manager to lighten his load on the EOP side we are now employing part-time, a retired army officer whose sole responsibility is the EOP records. The training period has been relatively lengthy but seems to be paying dividends.

In addition to Federal Council business there is a considerable amount of correspondence to the Executive office which by its very nature needs the attention of the Secretary Manager.

The matter of our office size has always been in our minds. Several possibilities have been investigated but have unfortunately fallen through.

During the year investigations were made into the computer programme and various possible changes were checked for feasibility and cost.

At this stage we have only made one major change and that is we are now producing the address labels for the magazine as Computer print-out from the membership list. This has eliminated the double handling of address records.

At this stage I would like to point out a problem that has arisen in the system and that is that in order for a new member to receive an early copy of "Amateur Radio" the relevant in-

formation must be forwarded to the Executive Office as soon as possible in order that his name be entered in the records, in some cases there have been delays.

### 4. IARU

During the year Peter Williams VK3IZ resigned as IARU Region 3 association secretary. As you may be aware Peter was one of the instigators of the formation of the Region 3 Association and I would like to take this opportunity of thanking Peter for his work in this field.

David Rankin VK3QV has been elected the new Region 3 association secretary.

Michael Owen VK3KI is Director of the Regional Association is the WIA liaison officer.

The Directors hope to have a plenary conference in Hong Kong either at the year or early next year to formulate the regional policy towards the 1978 World Administrative Radio Conference. It is also hoped to hold another regional plenary in 1978 just prior to the Conference to finalise regional policy.

As the IARU is now an accredited Agency as far as the ITU is concerned it seems that the Amateur Service may best be served by having IARU representation at the World Administrative Radio Conference rather than national delegations if finances dictate one or the other.

### 5. CUSTOMS IMPORT DUTIES

The Wireless Institute of Australia, properly recognising the legitimate claims of domestic manufacturers to reasonable Tariff protection, has pressed for many years that imported Amateur Radio equipment should be recognised as articles suitable for importation duty free or at low rates of duty if nothing suitable or equivalent is produced in Australia.

These efforts are now receiving recognition although as might be expected, success carries certain limitation. Work has not stopped in this field but is being continued with the objective of attempting to secure results of a more permanent nature and to this end the Institute presented a case before the Industrial Assistance Commission for the removal of duty on a wide range of Amateur use only equipment.

In a letter dated 15th May to the Institute from the Department of Customs and Excise the following two paragraphs are significant:

"Extensive enquiries have now been conducted in this matter and it has been decided that by-law admission of certain transceivers specially designed for use by licensed amateur radio operators would not be detrimental to local industry. Accordingly applications for by-law admission of transceivers accompanied by details of the equipment and supported by evidence that the user is a licensed amateur radio operator will receive consideration in the light of availability of suitably equivalent goods of Australian manufacture."

Whilst on this subject must express my thanks to Bill Colborne VK3BP who provided invaluable assistance to the Institute with his expert knowledge of the subject.

### 6. ACT DIVISION

At the last Federal Convention the following motion was passed:

"That the Canberra Radio Society be admitted as the ACT Division of the Wireless Institute of Australia after a period of 12 months from the date of Article 3 of the Articles of Association of the WIA."

On the 23rd July, 1973 the first general meeting of the Wireless Institute of Australia (ACT Division) was held.

A copy of the Constitution of this newly formed Division was forwarded to the Federal Council for examination.

This Constitution was ruled by the Council to be inconsistent with the general requirement of a Divisional Constitution in that there was no requirement of Amateur Licence holding imposed on full members.

Following this ruling in November the WIA ACT Division amended its articles to comply with the Membership requirements of the uniform Divisional Constitution.

This constitutional amendment is at present under consideration by the Federal Council.

### 7. REPEATERS

Since the last report a new repeater frequency plan has been accepted as Institute policy. The matter having been finally decided at an extra-

## STATEMENT OF INCOME & EXPENDITURE

for year ended 31st December, 1973

	1973	1972
<b>INCOME.</b>		
Members' Subscriptions	\$12,874	\$12,914
Publications, Mac. Income	4,473	3,864
Convent on	2,688	1,742
Amateur Radio	26,718	17,952
	46,753	35,372

<b>EXPENDITURE:</b>		
Amateur Radio	27,348	15,116
Audit Fees	180	87
Accountancy Fees	189	—
Bank Charges	192	803
Convention Expenses	2,271	2,362
Comm. Tel. Expenses	363	463
Depreciat on	148	187
EDP Expenses	834	1,854
General Expenses	144	1,210
Insurance	164	181
Licence	6	—
Project Australia	491	456
Provision for Bad Debts	200	—
Postage and Freight	1,309	661
Printing and Stationery	1,268	1,783
Rent and Power	1,320	758
Repairs and Maintenance	95	19
Salaries	10,583	10,179
Staff Advertising	25	—
Secretarial	102	1,190
Travelling Expenses	116	217
<b>TOTAL EXPENDITURE:</b>	<b>\$47,168</b>	<b>\$37,719</b>

DEBIT—To Accumulated Fund	\$415	\$2,346
<b>BALANCE SHEET</b>		
<b>as at 31st December, 1973</b>		

	1973	1972
<b>ASSETS:</b>		
Balance at 31st December	858	\$2,404
Less Deficit for year	(357)	415
	501	58
Reserve Fund	752	752
Special Funds—ITU Fund	8,903	8,903
IARU Fund	3,579	2,765
	\$10,877	\$10,478

<b>LIABILITIES:</b>		
Cash at Bank—General A/c	\$3,056	\$2,197
IARU A/c	1,489	1,469
TJ A/c	9,905	9,903

Sundry Debtors (after allowing for profits on to)		
Doubtful Debts—\$200	6,168	3,514
Stock on Hand—at cost	2,384	1,050
Prepayments	—	1,068
	\$19,906	\$16,222

<b>NON CURRENT ASSETS:</b>		
Furniture and Fittings—less Provision for Depreciation	593	741
	\$20,573	\$16,963

<b>DEDUCT—</b>		
<b>CURRENT LIABILITIES:</b>		
Sundry Creditors	2,782	4,117
Subscriptions in Advance	6,884	2,948
Loan VK6 Divs on	250	—
	9,916	6,485
	\$10,877	\$10,478

## Ordinary Convention held in September

I feel that when changes in Institute policy of this nature are being contemplated, careful logical and widespread consideration must be given to the matter.

## 5. SECTION 44 OF THE CONSTITUTION

This is the section of the constitution which holds over decision on a matter put forward as a postal vote until the next Convention.

This section was invoked again this year on postal vote. It is obvious that this safeguard must remain in the constitution in some form; however as it stands there is no mechanism of delaying a postal vote in order that further information may be sought other than to go the whole way.

The matter is scheduled for discussion at this Convention.

## 6. NOVICE LICENSING

At the last Convention the proposed novice licence was announced and it was hoped that the first novices would be on the air before the end of the year. However there has been a vast bank-up of legislation in Canberra and I dare not make a prophecy as to when we will hear the first novice.

The last Convention resolved that certain comments be made with regard to the proposed licence.

All were accepted except the proposed use of a segment of the 28MHz band and it was stated that the same was in operation in other countries. Consideration would be given to additional novice frequencies.

## 10. AERO MODELLERS

The announcement of the proposed novice licences and their allocation of the 11 metre band caused considerable concern to the Aero modeller fraternity who use this frequency for model control. Their concern was such that they took political action on the matter which caused the PMG's Department to ask the Institute for its attitude.

Discussions have taken place between the aero modeller representatives and the WIA at different levels, although the hazards of models caused by routine Amateur radio operation are not over. It seems that some band planning arrangement would be the best for the peace of mind of all concerned.

At this stage I would like to comment on the rather deplorable accusations that amateurs are deliberately sneaking down model aircraft. While I believe that the majority of Amateurs would abhor these actions I unfortunately feel that there are some irresponsible individuals who hold Amateur licences and have done just this.

It is action such as this that does the image of Amateur radio great harm and gives those who cover our frequencies added ammunition when they make their attacks. Disquiet at the attitude of some amateurs has been expressed to me again this year by members of the staff of the Post office as it was before the immediate Past President.

## 11. INTERFERENCE

In his opening address for the 1973 RD Contest Mr. Myral Wright, Chairman of the Australian Broad-  
casters' Control Board, made mention of the matter of interference. I would like to quote a portion of the address which I think has an important message for us all.

'While on the subject of interference, let me also refer to the problems and indeed, the responsibilities we all have - professional and amateur alike - in using the precious radio frequency spectrum.'

'The one important advantage which this national resource possesses compared with many of the other resources, is that the radio spectrum is not irreversibly consumed. It may be misused but with management and co-operation between the users the pollution can be recovered.'

Now in the case of the spectrum, I believe that the broadcasting users and the amateur radio users have a common complaint that they do not have sufficient channels. At the same time we both must keep our own houses in order to ensure that we use the channels which we do have to very greatest advantage and that we do not cause trouble to our neighbours. We must develop good housekeeping methods, reduce the amount of pollution or rubbish which we produce and, above all, we must attempt to keep our pollution within

## our own backyards.

As many of you will know, this simple housekeeping in the radio spectrum sense is now being promoted as a specialised topic within the field of radio engineering with the elaborate title of Electromagnetic Compatibility. Following submissions by Victorian Division representatives, the Executive had discussions with Mr J. Wilkinson (ADG ABCB) and Mr. J. Shanney (AGD Radio PMG's Department) together with several supporting members.

As a result of this meeting the Executive formed the opinion that the main concern was that the amateurs would take all possible steps to make sure that their own transmissions were clean and would not cause interference per se.

It was pointed out that at present only licensed transmitting stations were under control as far as interference was concerned. They are in fact only a very small cause of interference and that legislation is being prepared to enable these other sources of Electro Magnetic interference to be controlled.

The standard of performance of the front-ends of TV receivers is also to be covered.

It must be realised that the amateurs are only one of the services that are affected by the poor design of a TV receiver.

To deal with the potential interference problem the Executive has decided to form a WIA Central Interference Committee and urged the States to form their own divisional committees.

Outlets of the WIA Central Interference Committee.

1. To inform and advise the Federal Council through the Executive on all matters pertaining to interference as it may involve amateur operations.

2. To liaise with Divisional Interference Committees in States where the required experts might be unavailable.

3. To prepare material for use by the Executive in discussion with the appropriate authorities.

4. To carry out any special investigations which the Federal Council may require.

It is the feeling of Executive that the onus of seeking to cause interference must not rest solely with the Amateur.

Complainants must also bear responsibility to upgrade the efficiency of their systems and to co-operate.

## 12. MELLISH REEF

Due to a dispute between the parties making up a D Expedition to Mellish Reef some doubts were cast as to the validity of all of the contacts made. The ARRL asked the WIA for information as they were undecided whether to accept contacts to count towards the ARRL DXCC (they were recognised for WIA DXCC).

Michael Owen interviewed all but one involved and reported the evidence placed before him to the ARRL. The final decision is that of the ARRL.

## 13. INTRUDER WATCH

I would like to thank Alf Chandler VK3LC and his small but keen band of observers for the good work they are putting in. It must also be noted from the annual report of the excellent international relations they have developed.

## 14. CONTEST MATTERS

This is Peter Brown VK4JAP's last report as Federal Contest Manager as he hands over to Jim Payne VK3JZ after the Convention.

There was some confusion as to the use of repeaters in the RD Contest, which were allowed in the Contest after a last minute request from VK7 had been circulated to all Divisions. However the matter is to be brought before this Convention for a definite policy ruling.

## 15. AWARD MANAGERS

This year Geoff Wilson VK3AMK has handed over the job of Awards Manager to Brian Austin VK3CA. To both of these gentlemen I would like to say thank you very much. To Geoff for all the work he has done in the past and to Brian for the way he has settled into the job.

## 16. YOUNG

This activity of the WIA is in the capable hands of Bob Gubbert, Federal Co-ordinator.

It is apparent that with the imminent approach of novice licensing there will have to be some changes in concept in this area.

## 17. AUSTRALIA

The Australia group have again provided something very concrete in amateur radio with the continuing lists of Oscar 4 and I would like to express thanks to those who have acted as command stations as this is one of those jobs which although without glamour is essential for the life of the satellite.

Two members of the group have had papers accepted for the Symposium on Satellite Communications held in Adelaide. These are David Hull VK3ZDH and Peter Hamner VK3ZPH.

## 18. EXTRAORDINARY CONVENTION

On the 15th September 1973 an Extraordinary Convention was held in Melbourne on the requisition of the Federal Council for South Australia.

This Convention was called to consider motions originally submitted for decisions as postal motions by the Queensland and Victorian Federal Councils, and held over by implementation of Section 44 of the Constitution by the New South Wales Federal Council. As you are no doubt well aware this Convention set the WIA Nations Repeater frequency policy.

Many other matters of importance were discussed.

## 19. INDEPENDENT INQUIRY INTO FREQUENCY

The proposed inquiry was announced during 1973. However the terms of reference were not known. At this stage the VHF/UHF Advisory Committee were alerted as to the possibility of the need for case material.

In December we received directly from the Minister for the Media the terms of reference and the names of the persons who would be carrying out the inquiry.

In view of the terms of reference the VHF/UHF Advisory Committee were asked to prepare a case, which was placed before the Executive for review.

At this stage, due to the deadlines set by the inquiry, it was impossible to circulate it to the Federal Council for prior approval. As a consequence, the Executive authorised the submission of the material to the inquiry.

This material was immediately circulated to the Federal Council.

The material of the submission and a report on the hearing are to be published elsewhere.

I would like to thank Bill Rice VK3ABP and Peter Wolfenden VK3ZPA who presented the Institute's submission.

## 20. AARTG

Following the last Convention negotiations were carried out with a group of amateurs interested in teleprinter operation and consequently the Australian Amateur Radio Teleprinter Group was formed under WIA sponsorship to cater for the special needs of the RTTY operator.

## 21. FRC

The Federal Repeater Committee has had a difficult year and the chairman of the group has put forward some ideas as to its future which he hopes will be discussed at this Convention.

## 22. 75 ON BAND

Questions regarding the frequency requirements for the VHF/UHF Repeater and the VHF/UHF Advisory Committee who will have the benefit of the returned questionnaires. They are in the process of preparing a band plan which they hope to publish soon in order to invite comments.

## 23. 'AMATEUR RADIO'

I would like to congratulate the Editor of 'Amateur Radio' Bill Rice VK3ABP and his Committee on the high quality he has achieved despite all the difficulties they have experienced.

During the year the Executive became aware that the workload on the Editor was much greater than anyone could expect from a volunteer.

There were three possible solutions:

1. That the editor's responsibilities would pass back to the Executive Office.

2. A part time professional journalist be employed.

3. Pay an honorarium to the existing Editor to compensate for time expended in excess of that we could reasonably expect from a volunteer.

If the Executive office were to take over it would be necessary to take on further skilled secretarial

The third alternative which had the approval of the magazine committee seemed the most expedient and was recommended to and approved of by the Federal Council at the extraordinary Convention in September.

We have received an assurance from the Post Master General that 'Amateur Radio' will remain in Category B — however this still means a steep rise in the cost of postage.

The matter of advertising in the magazine has, as long as I can remember, been a problem. For most of the year advertising has been handled by the Secretary Manager. Several alternatives were under investigation but urgent Federal Council business often meant delays in making advertising contacts.

Just prior to this report a retired Airforce Officer has been employed part-time for a trial period with the sole duty of handling magazine advertising.

**24. MARCONI CENTENARY QSL CARDS**  
1974 is the centenary of the birth of Marconi and the South Australian Division has, as proposed at the last Convention, produced Commemorative QSL Cards which have proved to be a great success.

**25. AJA PLaque**  
The Executive had pleasure in accepting Mr Alan Shaw-Smith's (VK4SS) offer of an award, which is tenable for a period of ten years and which is named the 'Alan Shaw-Smith Journalistic Award for Amateur Radio Contributors'.

**26. FINANCIAL MATTERS**  
I am glad to be able to report that it was not necessary to obtain an overdraft from the bank this year despite early prediction that this may happen. I will leave the details of financial matters for the Treasurer to comment on.

**27. PNG'S HANDBOOK**  
Towards the end of the year the PNG Dept. expressed an urgent desire to reprint the Handbook for Amateur operators, and called on the Institute for comment on existing material. To this end we commenced work, forwarding material as soon as produced with the proviso in a covering letter that further comments may come in from the field.

I would like to express my appreciation of the courtesy with which the Radio Branch has always treated us. They are very much aware that there were sometimes extensive delays when dealing with matters concerning amateurs and Mr. Young expressed to me the hope that in the near future they will have an officer whose sole responsibility is Amateur affairs, thus speeding up things considerably.

**28. MEMBERSHIP**  
The following table sets out the membership details as at 31st December 1973 compared with total licensed amateurs (figures courtesy Radio Branch), percentages and totals for the previous year in brackets —

Male	Total	WIA Members	WIA Members	% WIA Members	Total Members
Licensees	Licensees	Licensees	Licensees	Licensees	Licensees
VK1/2 A.	2205	982	44	282	1244
	(2111)	(953)	(46)	(344)	
VK3	557	1041	80	388	1437
	(5021)	(5505)	(48)	(444)	
VK4/5 B.	848	436	31	146	578
	(831)	(362)	(42)	(180)	
VK5/6 C.	808	428	52	198	623*
	(797)	(265)	(49)	(237)	
VK6	516	254	46	88	329
VK6K	(830)	(218)	(41)	(109)	
VK7	239	152	63	93	215
VK2 D.	(231)	(183)	(98)	(81)	
Totals	6874	3292	48	1090	4417
	(6511)	(3008)	(46)	(1345)	(4641)

\*Includes 29 Junior Associates (unlicensed).

#### NOTES

A. Same Headings as above

B. 127 of 44 per cent 19 54  
C. VK9 (PNG) included for comparison but not now there: estimated 70 licensees in PNG (82 were country: on 30.5.73 — the last figure obtainable) of whom 42 were WIA members at 31.12.1973.

C.	58	—	38
D. VK9 estimated at 8. Total licensees in 'Other Territories' was 11.			
The license distribution was shown as—			
	Full Licensees	Limited Licensees	
VK1	95	31	
VK2	1477	804	
VK3	1308	749	
VK4	828	248	
VK5	804	248	
VK6	370	141	
VK7	154	79	
VK8	47	9	
	4484	2109	8593

I would like to record in this report the technical achievement of Ron Wilkinson VK3AKG in conducting a 1200MHz moon bounce contact with WA2HFA in the United States of America.

In conclusion I would like to thank the other members of Executive for their co-operative and unstinting support in this rather hectic year.

(signed) D. A. WARDLAW  
Federal President

## AUSTRALIAN VHF/UHF/SHF RECORDS AS AT MAY 1974

NEW SOUTH WALES					
50/52 MHz	VK2ADE to VE7AQQ	8/4/59	7320 miles	(11778 km)	
144 MHz	VK2ATO/2 to ZL2HP	2/1/86	1457 miles	(2344 km)	
432 MHz	VK4ZT/2 to VK4KE/4	12/7/68	219 miles	(352 km)	
578 MHz	No claim				
1296 MHz	AX4ZT/2 to AX4NO/4	12/4/70	250 miles	(402 km)	
2300 MHz	VK2ZAC/2 to VK2BDN/2	10/5/73	99.4 miles	(159.9 km)	
3300 MHz	VK2AHC/2 to VK2SB/2ZND/2	10/2/74	37.0 miles	(59.5 km)	
5860 MHz	VK2AHC/2 to VK2SB/2ZND/2	10/2/74	37.0 miles	(59.5 km)	
10000 MHz	VK2AHC/2 to VK2SB/2ZND/2	10/2/74	37.0 miles	(59.5 km)	
VICTORIA					
80/100 MHz	VK3ALZ to XE1FU	1/5/69	9416 miles	(15345 km)	
144 MHz	VK3ZNC to ZL2HP	13/12/65	1673 miles	(2692 km)	
432 MHz	VK3ZYU to VK5ZDY	1/2/70	406.4 miles	(654 km)	
578 MHz	VK3AOT/3 to VK3ZKB/3	11/4/71	147.5 miles	(237 km)	
1296 MHz	VK3AKC to VK7ZAH	17/2/71	273 miles	(439 km)	
2300 MHz	VK3XA to VK3ANW	18/2/50	9.0 miles	(14.5 km)	
3300 MHz	VK3ZGT/ZGK/3 to VK3ZDQ/3	14/12/83	63.0 miles	(101.4 km)	
5850 MHz	No claim				
10000 MHz	No claim				
QUEENSLAND					
50/52 MHz	VK4ZAZ to K8ERG	16/3/58	5305 miles	(8536 km)	
144 MHz	VK4ZAZ to VK7ZAH	1/1/67	1187 miles	(1910 km)	
432 MHz	VK4KE/4 to VK4ZT/2	12/7/68	219 miles	(352 km)	
578 MHz	No claim				
1296 MHz	AX4NO/4 to AX4ZT/2	12/4/70	250 miles	(402 km)	
2300 MHz	and above	No claims			
SOUTH AUSTRALIA					
50/52 MHz	VK5KL to W7ACS/KH6	26/8/47	5361 miles	(8626 km)	
144 MHz	VK5BC to ZL2HP	23/12/65	1957 miles	(3149 km)	
432 MHz	AX5ZKR to AX7ZRO/7	18/3/70	482 miles	(776 km)	
578 MHz	VK5ZJL/5 to VK5QZ/5	28/12/69	195 miles	(314 km)	
1296 MHz	VK5ZSD to VK3ZHU/5	28/9/69	75 miles	(121 km)	
2300 MHz	No claim				
3300 MHz	No claim				
5850 MHz	No claim				
10000 MHz	VK5CU/5 to VK5ZMW/5	30/12/71	89.5 miles	(95.7 km)	
WESTERN AUSTRALIA					
50/52 MHz	VK6BE to JA8BP	30/10/58	5490 miles	(8833 km)	
144 MHz	VK6KJ to VK3AOT	1/2/70	1517 miles	(2441 km)	
432 MHz	VK6ZDS to VK6LK/6	25/4/66	66 miles	(106 km)	
578 MHz	VK6ZDS/6 to VK6LK/6	15/12/63	101 miles	(163 km)	
1296 MHz	and above	No claims			
TASMANIA					
50/52 MHz	VK7LZ to JA9IL	3/12/59	5462 miles	(8786 km)	
144 MHz	VK7ZAH to VK4ZAZ	1/1/67	1187 miles	(1910 km)	
432 MHz	AX7ZRO/7 to AX5ZKR	15/3/70	482 miles	(776 km)	
578 MHz	No claim				
1296 MHz	VK7ZAH to VK3AKG	17/2/71	273 miles	(439 km)	
2300 MHz	and above	No claim			
N.B.—Australian records are in bold type.					
AUSTRALIAN EME RECORDS					
144 MHz	VK3ATN to K2MWA/2	28/11/66	10417 miles	(16761 km)	
1008 MHz	VK3AKC to W2NFA	6/10/73	10385 miles	(16713 km)	
AUSTRALIAN E.T.Y. RECORDS					
432 MHz	VK7EM/T to VK3ZPA/T	13/12/72	256.6 miles	(413 km)	

# Audio derived AGC for SSB receivers

By JOHN, VK5QZ (John A. Hackworth)

Reprinted from the SA Wireless Institute Journal, July, 1971.

The following circuit is intended for use with a receiver incorporating a conventional IF amplifier and SSB detector using ordinary transistors. The objectives in its design were:

1. Wide signal handling range.
2. Smooth S-meter characteristic over a wide range.
3. Delayed AVC decay or hanging effect to prevent undesirable pounding on strong signals, and give steady S-meter reading.

giving a linear S-meter characteristic.

Fig 3 shows how to wire your IF stage to suit this AVC circuit. The negative point marked (1) is normally connected to earth but this should now be connected to the AVC circuit shown at point (b) in Fig 1. Normally there will be several transistor stages so all the negatives should be connected to the AVC point (b) in Fig 1.

If your IF amplifier has been wired such that it is not possible to bring out the negative rail, separate from earth, then try the alternative circuit of Fig 2. This takes the place of that part of the AVC circuit to one right of section A-A (Fig 1). This will provide a positive output control voltage for the IF stages. This circuit has not been tried in practice so you may have to juggle with the resistor values for best operation.

Remember that the AVC control voltage (for either method) must be only connected to the IF and/or RF stages and not to the mixer oscillator or BFO detector stages.

## AVC Delaying Decay Circuit

The audio signal should be taken from the output of the SSB detector in the receiver, or at any other convenient point between the detector and the volume control. About 100mV is required, depending on the gain of the AY112. This is amplified and rectified by two sets of voltage doubler type circuits, producing negative DC voltages on C6 and C7.

The negative voltage across C7 is applied to the gate of the FET and in turn a negative-going voltage on the base of Q3 produces a reduction of current and thus the voltage drops across terminals (a) and (b).

When the received signal ceases transmission and there is no audio output the voltage on C7 remains constant, thus holding the AVC up until C8, which is charged to a higher negative voltage than C7 discharges through R9, D5 becomes forward biased and both C6 and C7 discharge rapidly.

The delay time can be altered by varying the value of R9. (10 megohm). The resistors R7 and R8 are inserted to reduce the effects of ignition noise. The attack time can be reduced if desired, by using lower values for R7 and R8.

The diodes used in the writers circuit are Miniwatt type OA202 but any high back resistance silicon diodes will be satisfactory. (If you don't have OA202 diodes try the Fairchild series AN1002 etc.)

## INITIAL SETTING-UP

The overall performance of the AVC circuit will depend to some extent on the IF gain and the audio output level from the SSB detector stage, therefore you will need to check the following points.

1. S-meter reads too high/low on the scale on no-signal condition. **Remedy:** increase/decrease the value of the resistor,

## EXPLANATION OF THE CIRCUIT

### Method of applying AVC to the IF amplifier

It is well known that the technique traditionally employed on valve IF stages to control gain is to apply negative bias to remote cut-off valves.

When applied to transistor stages this method has serious limitations since remote cut-off transistors are not available.

A method which gives improved results is forward biasing of the transistors. The method employed in this circuit is to control gain by reducing the collector voltage so that the transistors in the IF amplifier pass into the so-called triode region of the collector volts but remains fairly linear to small signals.

As a result, large signal handling is assured, and the gain voltage characteristic is very smooth and roughly logarithmic

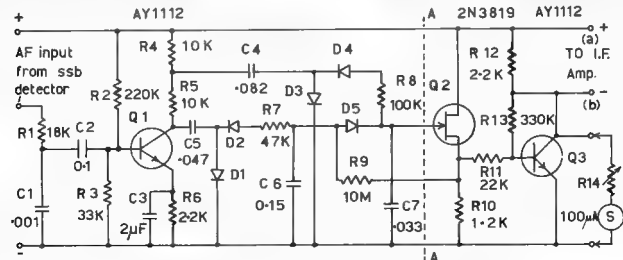


FIG.1. - AUDIO DERIVED AVC FOR SSB RECEIVERS

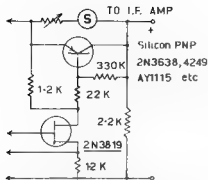


FIG. 2. ALTERNATIVE DC AMP

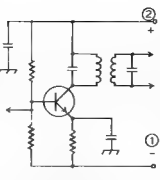


FIG. 3. TYPICAL IF STAGE

R1, connecting to the SSB detector output.

2. Strong signals do not cause full scale reading. Remedy: adjust resistor in series with the meter.

3. Strong signals overload and distort this may occur if using an S meter of low sensitivity such as a 0-1mA movement. If this is so, try reducing the load resistor across terminals (a) & (b), R12, from 2.2K to say 1K. (The purpose of this resistor is to offset the current which bleeds through the S-meter circuit)

4. The source voltage of Q2 should be about plus 2 volts with the AF input disconnected. If it is not within about 1/2 volt of this, try another FET or adjust value of D18.

## a funny thing happened to me in the shack the other night

ALAN SHAWSMITH, VK4SS

36 Whynot Street,  
West End, Brisbane, 4101

We all have a fetish about something. I've been an unabashed contest compulsive. Thirty years ago a 48hr. non-stop "sweat" would have been a breeze. Now it's a case of an old dog for a hard road and even with a quota of tricks, a three decade gap between grey hair and youth is too much of a handicap. OT's in my shape don't win contests any more, they just participate.

Now, in any stint, I must confess, the tortures of an aching back, head, wrist or ear soon begin to create discomfort and asp concentration. "Modus operandi" in the radio shack at night is to have the room in darkness except for a small light on the log book. Hearing my small daughter in the bathroom, I called to her to bring me a headache powder from the cabinet. This she did and I hastily unfolded it and gulped it down. It tasted odd but I was too busy to bother and keen to pick up every QSO and point possible.

The hours dragged on and the headaches only got worse. At bedtime, my daughter came in for a good-night kiss. I asked her for another powder and washed it down with the dregs of a cup of stale, bitter tea. Again it tasted lousy but I blamed it on the dryness of my mouth. About an hour later I began to feel light-headed and queasy and had to lie down on the shack divan.

"Honey," I called, weakly, to the YF, "You still up?"

"What's wrong?" The voice from the bedroom was unsympathetic.

"I don't feel so good—musta bin something I ate."

"Well it wasn't dinner or supper. You've been too busy to eat."

"I've only had a couple of headache powders and it couldn't be them."

There were sounds of the YF hurriedly getting out of bed. She appeared from the bathroom, switched on the light and held out a box of powders and said, "There's no analgesics; I forgot to get them in."

"Well, what are these—?"

"De-worming powders for the dog."

"De-WHAT?" Rage overcame my aches and pains. I sat up and bellowed, "That bloody hound has more status around here than the rest of the family. Since when does its medication mix with ours?" I sank back miserably on to the divan, "Get the doctor, I feel 'crook!'"

"It's eleven p.m. You can ring him up with a tale like that at this hour, but not in!"

The local GP is a pretty good friend, so I dialed him. "er Mac," I said sheepishly. "I've just swallowed a couple of de-worm dog powders. I thought they were aspirin."

"You're back on the brandy. You've had another lapse."

"No, no, it's fair dinkum. I really did and now my insides—"

A great guffaw echoed out of the headset. "Listen pal, you don't need me, you need a vet!"

"Very funny," I said testily. "All I want to know is—well, will I be OK?"

"Ha, ha, ha, they're a harsh purgative you know."

"Well, I have a radio contest going."

"Oh, yes, your usual week-end sub-cult ritual. Well just ignore the symptoms. They'll pass away—and carry on."

I did carry on—all the week-end. But not in the contest.

### WARNING

In terms of PMG directions\*  
from 1.3.1974

**UNDELIVERABLE and  
UNDELIVERED A.R.  
WILL NOT BE RETURNED  
TO SENDER**

**Unless you advise your  
CHANGE OF ADDRESS**

to the Executive Office  
P.O. Box 150, Toorak, Vic., 3142  
at least one month in advance  
you may miss your A.R. No replacement can be sent to you unless accompanied by 70 cents per issue (subject to copies being available.)

The above applies only when you change your address

\* Letter V 228/1/17 of 30.11.1973 (services)

# VK ZL OCEANIA DX CONTEST 1973 RESULTS

VK — PHONE									
Call	1.8	3.5	7	14	21	28	Total		
VK1AOP	475	110	8820	2780	1330	11880			
VK1JX			8750	2575	750	11075			
VK1DA			300	425	125	850			
VK1APK	210	810	10035	7155	3585	20210			
VK2BFB	185	2320	9200	5335	2665	19955			
VK2JX			8855	2535	730	9650			
VK2GAX			4215	2380	800	6800			
VK2ABO	65	4220	1590	850	6725				
VK2BTT			1820		5820				
VK3MR	248	875	5981	3255	55	10111			
VK3BM			3360	4150		7510			
VK3APW	165	480	4820	825		6000			
VK3AYO			4475			4475			
VK3ARY			1305	845		4040			
VK3EP			475	220	320	1910			
VK3AFH			4770	8190	1895	14855			
VK4EZ			5555			5555			
VK4DO			3015			3015			
VK4LZ			1850	930		2635			
VK4PJ	55	55	1580	1180		2860			
VK4XY			480			480			
VK4OX			875	8725	1715	7815			
VK5WV			4740			4740			
VK5RO			1470	1860		3330			
VK6PG			2720	3525		6245			
VK6TU			1505	345		1850			
VK6RL	110		305	60	205	735			
VK7BK	485	4845	7840	3200	810	17050			
VK7AZ			850	475	185	1200			
VK7RY			10300			10300			
VK8EJ			1230	1180		2380			

ZL — PHONE									
Call	1.8	3.5	7	14	21	28	Total		
ZL1BKX	200	165	920	11775	5585	3015	21080		
ZL1AIB			11980				11980		
ZL1AYG/BLR			11460				11460		
ZL1AMM			6740	3535		10275			
ZL1AIZ	580	1885	2970	2565	1820	9670			
ZL1MQ	110	185	5175	2210	770	8430			
ZL1BKL			7745			7745			
ZL1AKY	310	55	4265	3075		7705			
ZL1ANH			2145	410	55	2610			
ZL1ACP	165	165	3210	4365	810	12565			
ZL1TS			6480	3115	780	8375			
ZL2AWH	2025					2025			
ZL4BO			5835			5835			

VK — CW									
Call	1.8	3.5	7	14	21	28	Total		
VK1AOP	205	1065	1715		560		3245		
VK1DA	405		905				1310		
VK1APK	940	3485	8430	4325			15795		
VK2GX	400	1770	8810	3370	340		13680		
VK2VN	1835	1715	3930	1305	920		8705		
VK2BQD	55	2235	4270	905	7485				
VK3KL	815	1495	1400	770	560		5640		
VK3BAC			5625				5625		
VK3GAX	870	825	3585	1480	55		6420		
VK3BFB			825	1250			1775		
VK3AKX	275	3545	4805	4870	10		13565		
VK3MR	880	5235	6470	2725			15320		
VK3BX	55	1005	1665	8000	3845		12570		
VK3MJ		285	1710	7280	2915		12180		
VK3CP	1870	4185	2105				7260		
VK3AYO			3850				3850		
VK3BRO			135	40	385		560		
VK3RJ	230						230		
VK4XY			1485				1485		
VK5NO	840	3165	7430	4860	155		16650		
VK5FM			3280	1980			6270		
VK5OR			960				960		
VK6PG			3380	4100			9080		
VK6RS	55	375	385	135	270		1220		
VK7RY	165	55	375				585		
VK7GK	1695	8605	6805	2805			17965		
VK8BA			55	725	2250		3030		
VK8EJ							5610		

ZL — CW									
Call	1.8	3.5	7	14	21	28	Total		
ZL1AMM	780	1370	6030	5300	900		14580		
ZL1AYG/BLR			11465				11465		

ZM1APW	2355	5080	2295	545	10285
ZL1ARY		8460	1140		7800
ZM1AIZ	2145	1770	1295	1585	7310
ZM1HW	2285	1780	340		4800
ZM1MQ	180	570	1800	255	5780
ZL1BLB		5420			5420
ZM1AM	6415				5415
ZM1HO		345	1955	100	3305
ZM1TB					3045
ZM1RAY	1170	735			1805
ZM2TG	755	1155	8915	3685	535
ZL2ACP	455		2180	530	3065
ZL2AKW					1630
ZL2AWH	1280				1230
ZL3B		8895			8895
ZL3QG		4895	1040		5935
ZL4AW					

VK — ZL — SWL									
Call									
L30843							1890		
L40104							3440		
L80121							2305		

PHONE — ASIA									
YB3CW	1482		58300				7904		
YB3CJ	848		9171J				1390		
YB2CX	84								

PHONE — OCEANIA									
C21AA	5912		KH8GAP			23135*			
C21NI	1544		KH8RS			1730			
KG4JA	13020		YJ8BL			3888			
KH8J	23718								

NORTH AND SOUTH AMERICA									
VE7VP	2784		W7SFA			13572			
VE2APC	1840		KV1R			480			
W2FZ	1840		W8J3			161			
W2GZ	3888		W8CWM			115			
W2 (LJ1BAR)	480		W8GJM			5875			
W2TV	172		CE8AO			920			
W4WSP	4284		KH8BWX			320			
W4ORT	3125		LH8FT			5282			
W6PLH	16388		OAAAL			214			
W8VL	4049		PY1EAM			24			
W8OXS	4117		PY1BDJ			2345			
W8DGH	3888		PY2APH			2345			
W8AFIT	1830		YV5-DLH			1080			
W8RQZ	18								

PHONE — EUROPE									
DL2UU	80		OK1KCP			892			
DL4NU	3782		OK1ADM			286			
DT2ATL	2488		OK1MOW			216			
HABOV	40		OK1MP			180			
HAKRRL	35*		OK1AEZ			95			
HAKRMA	30		OK2SIR			72			
H89IK	380		OZ8MI			846			
HELL	1484		SM7ACB			2091			
LAMH	1728		SK8AW			86			
LASOK	38		SP3OO1			1880			
LA LM	20		SP6PZ8			1001*			
LZ1QZ	1152		SP5PWK			288			
OK4SG	3880		SP5GZT			188			
OK2BQ	949		SP5DM			123			
OK2BMO	584		SP5ABU			40			
OK2H1	40		SP8A1			33			
OK2BFX	12		YOFZ			126			
OK2HW	4		TU1BCD			2348			
OK2BJ	840					21			

PHONE — WORLD-WIDE									
GJ2GJ	108		CR71Z			8			
OD5BA	450								

JAPAN — PHONE									
JA1CND	7688		JE1VTZ			30			
JA1ILJ	6914		JA2SGE			2736			
JA1OCX	19717		JA2JY			3680			
JA1JGX	2338		JA2QJ			830			
JA1WVK	1720		JA2JAB			874			
JA1STN	1034		JA2SAP			574			
JA1AAT	748		JA2BFT			333			
JA1HBT	682		JA2HWF			36			
JA1VP	120		JA2HJF			10			

\*Multi Op Station

JASA4W	8907		JA8CM	539
JA8BLN	1898		JA8YD	400
JA8LVP	1045		JA8CRA	270
JA8XRC	182		JA8EFT	107
JA8GV/4	10787		JA8BG	90
JA8WBK	350		JA8TJ	6235
JA8MD	310		JA8UC	528
JA8GCN	264		JA8HL	147
JA8JUN	60		JA8KM	8
JA8BM	2576		JA8RY	1358
JA8TR	830		JA8BMG	9214
JA8GL	312		JA8CH	1900
JA8U	688		JA8YE	748
JA8EQ	444		JA8HZ	238
JA8VC	340		JA8WZ	210
JA8VNC	40		JA8MB	872
JA8TU	8880		JA8AE	85
JA8CAW	590			

PHONE — U.S.S.R.				
EUROPEAN U.S.S.R.				
UK6LAZ	4178*	UK4NAA	1008*	
UK4WAB	2180*	UK3AAC	694*	
UK4QAS	1788	UK3OM	684	
UK4ICB	1470	UK4WAR	315*	
UK4MPP	1404	UK4WU	304	
UK3ABD	1280*	UK4WAC	310*	
UK3YAB	1027*	UK3SAB	105*	
UK4ICK	1020			

## Newcomers Notebook

... ..

44 Rathmullen Rd., Beronia, Vic., 3152

What is **Zero Beat?** This is the magazine of the **Youth Radio Club Scheme**. It is published by Bert Grove of South Australia every month or so, and has approximately a dozen duplicated pages of information for beginners, and certainly suitable as a refresher information for those who have been around electronics for some time. The YRCS produce not only a fine little magazine but a variety of small, inexpensive construction kits ranging from BFOs, transistor checkers, signal injectors, RF amplifiers (for sick receivers); and I have no doubt they are designing more kits. These kits are produced by VK3AQ, R. J. Callender, 383 Warrigall Road, Burwood, 3125. I think that Bob is assisted by Roger Sewell? on these projects.

Why am I telling you all of this? The YRCS is allied with the WIA and as such each group can be of assistance to the other. I would suggest that newcomers who are just starting in radio/electronics consider seriously joining the YRCS. For information, I suggest that you contact the appropriate State Supervisor, his address is shown in the directory insert in the February issue of AR.

Over the next few issues I hope to present excerpts from *Zero Beat* which are helpful in themselves and additionally show people the style of article to be found in *Zero Beat*. Most of the excerpts will be from the section named **Short Circuits**, a section on hints and kinks on better methods to do certain jobs.

### SHORT CIRCUITS

Zero Beat June '73

There are many times that a heat sink is required when removing transistors or other small parts from a printed circuit board. Usually the space between the board and part is too small for long nose pliers or other radio tools. An ideal solution to the problem is a pair of ordinary pointed tweezers from the first aid kit. Many more uses will be found for these, particularly when dealing with thin wires, so it will be an asset to keep a pair on hand.

**Zero Best June '88** by H. Smith VK3ZYC

1. Mechanical hum in a radio receiver or amplifier is often caused by loose laminations in the power transformer. This hum can usually be eliminated by tightening the long screws that hold the transformer together: they often extend through the chassis base in certain turns of the

2. A short length of fibre insulating sleeving may be used to remove or replace dial lamps in hard to reach places where the hand is too large for the job.

EUROPE - CW			AFRICA				
DLRNU	3525	OK3KAP	232*	UK3UAL	2100*	UGSVY	099
DLRPT	638	OK3RC	152	UK31BM	1857*	UK31AT	462*
DT2JD	2540	OK1DWA	114	UK5WBQ	1580*	UG5GBD	280
DM3Q0	2322*	OK1DIM	90	UB5OE	200	UT5LN	44
DM4YEL	1364	OK3BH	84	UK3LBJ	145*	UK5E1AM	38*
DT2BTO	65	OK1TW	40	UB5WAB	133	UK5GBN	33
DM7BL	160	OK1W	38			WHITE RUSSIA	
G3KSP	8	OK2BGR	24	UK2WAF	1615*	UC2WP	168
HG5A	1275	OK1AUP	12	UC2WAL	264	UK2WAE	70*
HAK8EM	1245*	OK1ATZ	8	UC2XK	224		
HAK2RL	586*	OK1KZ	4				
HAK5FA	182*	OZ7HT	620			UZBEKISTAN	
HAK3NA	147	OZ1W	256	UD6BO	1085	UD6DHJ	24
HAK5FU	102	OZ5CI	242	UK6DAJ	281*	UD6BW	18
HAK4XX	96	OZ7XG	32				
HAK8DX	1060	SM0CCE	86			GEORGIA	
HAK5PV	86*	SM0EKO	5				
H8B1K	378	SM0CCM	228	UF8QAC	96		
H8SAUR	128	SM0BVQ	8			ARMENIA	
H8SAFI	112	SP8DOI	648	UG6JJ	80		
H8BQ1	578	SP9CTW	482				
J2WAD	280	SP8PZB	264			YEMEN	
LZ1FI	48	SP7BFC	264	UH8BO	84		
LZ1KAU	8	SP8ARU	147				
OH1TH	1008	SP1PFC	108			YEMEN	
OH56L	796	SP5AKN	90				
OH3AJ	176	SP2AOB	90	UK6TAA	788*	UI6CD	405
OH7NW	132	SP2AVE	72	UK6AA1	506*		
OH2DN	30	SP8ACN	58			TANZANIA	
OH8TD	18	SP9PWK	50	UJ8AB	26	UJ8AB	7
OH8PH	2	SP9ABU	40				
OK1KOK/P	2970*	SP6DMJ	2			KAZAKH	
OK1K90/P	1280*	SP2BFC	6				
OK3QK	880	YU1BQD	1186	UL7TAM	88		
		YU1SE	2			MOLDOVA	

Why am I telling you all of th

				LITHUANIA	
J41HLN	7890	J4JGZ	102		
J41SLV	5654	J4ARVO	80	3889*	100*
J41CMD	6738	J4SXX	2553	132	UP2BAO UP2BAS
J41FGB	844	J4DGM	1617		
J41PCY	870	J4SEVQ	410		
JHIOFW	880	JVSCEK	270	488*	UC2PJ
JH1BBT	522	J4BJML	1515		
J41VP	440	J4BDOB	238		
JR1PVX	367	J47IKH	4316		
J41QXZ	284	JATFC	3C58		
JF1RPZ	184	J47JW	400	DM-2703/A	738
JF1OPB	96	J47GAX	315	DM-4043/L	800
J42XPJ	889	J47NU	308	DM-8405/H	70
J42OJ	804	J4EZO	4480	RHS32525	LN986
JMRBFY	3	J4RIEV	2540	RGS26431	4100
J42EG	2	J4BAGZ	50	J41-11614	6885
J42AAW	4286	J4BCIH	1882	J41-4878	882
JH3LKN	5538	J4OCVC	1292	J43-7604	548
J43EA	2004	J4A6SH	182	J44-4855	1220
JH3GN	2	J4ADIAD	85	J48-2186	25
J44QNM	8890	J4BGR	348	UA9-1018	7334
		J4JGZ	102		

### Zero Beat June '73

EUROPEAN F.B.R.			14-20981	2176	UAB-145-197	1200	
			1TR-1A257	704	UC2-009-195	789	
UKMLEZ	4475*	UA3NAD	315	150-2048	572	UC2-006-12	732
UK3YAB	2590*	UIA1QAU	240	12-142025	363	UC2-006-50	84
UA4QM	1616	UK1AAQ	180*	15-50661	304	UC2-001-3	256
UK4AJA	1025*	UIAFM	180				
UKAKWAB	1001	UIARV	157	14-15407	304		
UA3GM	980	UK4AA1	136*				
UA3ABD	741*	UAJST	126	JA02230	494	OK1-17825	80
UK3SAB	840*	UA3DEA	86	OK2-14780	405	OK3-26238	80
UW4NP	867*	UWGHV	36	OK1-11861	350	OK1-13168	12

...it will be all about to keep it  
hand.

UA0FQM	12222	UA0CBM	513	W4JUK	F8BJP
UA0FRZ	5017	UKRLA	247*	LASU	302ER
UA0JOC	4482	UA0JNH	192	W2NC1	DT2BCD
UA0JUN	4008	UA0JL	180	SM8PF	VE3CEA
UA0JNN	2988	UW9WB	105	8Z4PM	VR1MS
UW9PT	2300	UK3OBK	90*	DA2AYK	UA1ZAM
UK0SAL	1486*	UA0LAF	60	VK5ZX	UA3TAM
UW9WIL	804	UW0LT	58	OK1APS	UW9YS
UW9WAT	870	UA0CBR	46	DT3CYD	UK4RAB
				DA2DHN	UK4WAC
		KALINGRADSK		DA22UN	UA6AJJ
UA20P	120			DM2BEU	UK9AAC
				SP3CDQ	UK9AAC
				VK4RF	UW1OR

總編輯 鄭永福

Use sleeving slightly smaller than the glass bulb so that when forced over the bulb it grips it tightly, thus providing a tool that will enable you to unscrew or re-insert the lamp in its socket.

#### Zero Beat February '89

1. Experimenting with circuits on a bread board construction and want an easy way to mount a toggle switch? Open the eye of a half inch screw eye until the switch barrel fits inside, then clamp the eye back with the pliers. The lock nut on the barrel will hold the switch securely, and the whole assembly can then be fixed to the bread board by screwing into the wood.

2. How many times is a former required for winding that test coil on and nothing available? This is easily overcome by keeping on hand some short pieces of Electricians PVC conduit, which is obtainable in diameters from five-eighths to two inches or larger, and is excellent for nearly all requirements. (Can be lossy at VHF however, VK3UG).

#### ELECTRO MAGNETIC COMPATIBILITY

Did you know that the September issue of AR is intended to be an issue devoted exclusively to EMC? The 30th of this month is deadline for any articles, comments, etc., on this subject. Being a newcomer you may be experiencing interference or may be causing it, but you do not understand it. Perhaps a letter to the Editor could be useful to highlight some aspect of interference you've come across. The September issue should be of help to many people who are just not aware of the problems of interference. It may come as a surprise that AR has had more articles on this subject over a period of ten years, than any other magazine that I have read. If you wish to contribute, do so now — straight away — if not sooner.

Next month I hope to have some more **SHORT CIRCUITS**.



#### A REQUEST

Since this column started there has been quite a bit of favorable comment in support. Unfortunately there has not been quite enough support in the form of contributions. Every amateur at one stage or another builds a new piece of equipment or modifies some existing gear. In the process he strikes problems and overcomes them. The solutions to these practical problems may be of help to others, so why not put pen to paper. Without your help, the column will not be able to continue.

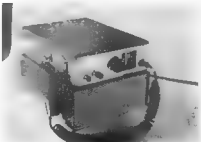
#### HOW TO SUBMIT

Capacitors and resistors which have been stored for some time develop tarnished pigtail and are difficult to solder. One solution is as follows. Take an ink eraser, the hard type with a gritty filling, and carefully slice a number of parallel slots in one edge using a razor blade. The slots should be spaced about 1/16 inch apart and about 1/8 inch deep. Bend the rubber so as to open one of the slots and push the pigtail of the component into the slot so that the body butts up against the rubber. Release the rubber so that it clamps onto the wire and pull the pigtail through the slot. If all the oxide is not removed on this push-through repeat until the wire is clean and bright.



#### AC POWER SUPPLIES FOR SOLID STATE TWO METRE TRANSCEIVERS

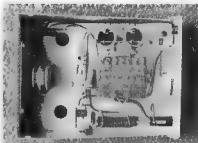
A couple of months ago, when discussing AC power supplies for valve-type car phones, it was noted that low voltage high current supplies presented quite a few problems. At that time we took the other approach and adapted the transceiver to operate from a standard supply delivering high voltage DC and low voltage AC for the filaments. However when we consider AC supplies for solid state rigs running around ten watts output, the current requirements usually do not exceed two amps. At this output, special components such as heat sinks and large transformers are not required.



Homebrew equipment can be made to match the appearance of commercial units.

From the constructional point of view, the unit illustrated was designed to match my Trio TR7100 both in size and appearance. With slight changes it could match other popular FM transceivers such as the Yaesu FT2F or FT2FB, as well as the Icom IC20.

The circuit for the unit was borrowed from the September 1989 issue of Amateur Radio, being part ten of the Solid State Transceiver series. The transformer used in this supply is the A&R type 5526. This transformer is rather large for the trans-



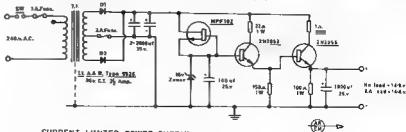
Underneath view of the AC PSU described in the article. The transformer used in this supply is the A&R type 5526. This transformer is rather large for the transceivers mentioned above but would be ideal for solid state rigs running up to twenty watts output. As a saving on both cost and size, I have used an A&R type 6978. This has a 15 volt 2 amp output and of course requires a bridge rectifier, in place of the full wave as used with the larger 5526. Four five-amp diodes were used and any with a PIV of 50 or 100 volts would be suitable. The power supply illustrated uses MR751 diodes rated at 5 amps.

#### CONSTRUCTION

I do not intend to give any dimensions of the power supply cabinet as these will vary depending on the particular transceiver it has to match. However a few details of methods used will be described. The basic chassis consists of a U-shaped piece of 20 gauge aluminium. Across one end of this a speaker is mounted on a scrap of hardboard with a piece of fine gauge expanded aluminium formed around this. This is then fitted into the chassis by two small right angle brackets and a few dabs of araldite. A panel to carry the output and input connections is now fitted into the other end. Use either hardboard or aluminium depending on your metal bending capabilities. To complete construction another U-shaped section of aluminium is made up to fit over the first piece. Finish with a spray paint to match your particular rig and fasten to the chassis section with four self tapping screws.

The brackets holding the transceiver on top were secured with araldite before painting.

Next month a picture story on a few simple modifications and additions to one of those popular KEN transceivers.



CURRENT LIMITED POWER SUPPLY

The emitter resistor of the 2N3053 shows 150 ohms. This should be increased to 1000 to 1500 ohms



**EMC**  
an expanding world  
With Eric Jamieson VK5LP

**AMATEUR BAND BEACONS**

VKD	VK0R50	Macquarie Island	52.180
	VK0R50	Mewson	63.100
	VKDGR	Casey	53.200
VK1	VK1RTA	Canberra	144.478
VK2	VK1RW	Sydney	52.450
	VK2WV	Sydney	144.010
VK3	VK3RTG	Verment	144.700
VK4	VK4W12	Townsville	82.800
	VK4W11	Mt Mowbrall	144.400
VK5	VK5W1	Mt Lofty	83.900
	VK5VW	Mt Lofty	144.800
VK6	VK6VF	Perth	82.3015
	VK6RTT	Camperdown	82.380
	VK6RTT	Camperdown	92.800
	VK6RTW	Albany	144.500
	VK6VF	Perth	145.000
VK7	VK7RTX	Davenport	144.800
	VK7VF	Darwin	82.200
P29	P29GA	Lao, Niugini	145.100
ZL1	ZL1VHF	Auckland	145.100
ZL2	ZL2VHF	Wellington	145.200
	ZL2VHF	Palmerston North	145.250
ZL3	ZL3VHF	Christchurch	145.300
ZL4	ZL4VHF	Dunedin	145.400
JA	JA10Y	Tokyo	82.800

\* denotes change from last month.

Roger VK2ZRH, of the VK2 Division Beacon Committee, has sent advice that the VK2WV beacon is now on 144.010 MHz, with FBK Ident. 850 Hz shift, moving down in frequency for key up. Initial tests show the frequency to be within 10 Hz per day. The 8 mtr beam will remain as is for the near months when Ident. will also go to FBK. Other members of the beacon committee are Brian VK2BX and Roger VK2ZTB. Thanks Roger VK2ZRH for your information, also a note regarding the same beacon from Roger VK2ZTB. Thanks to you also.

The VK8 VHF Group News Bulletin mentions the new solid state beacons over there are now nearing completion. The 6 mtr beam is putting out about 6 watts on 52.3016 MHz (previously the frequency cannot be pulled down the last 1.6 kHz without upsetting the FBK). The 2 metre beam on 145.0 MHz is putting out about 6 watts. Both beacons are using FBK 650 Hz shift. Main problem now is the provision of new aerials, and it is expected the old aerial will be pressed into service for the 10m beam.

Also very happy indeed to have had a communication from Noel Spelding Box 757, Lao, Niugini P29GA, who advises his beacon with that call sign (previously VK0GA) runs an endless tape with a one minute break every three minutes, transmitting A32 from a FTDX400/FTV850 combination to 6 S element yagi pointed due south at 32 feet height. The QTH is from his residence on the campus of the PNG University of Technology, 7 miles NW of Lao.

Karl passes on the news that he uses a VK3 six metre beam in the front and the back of FTV600 with the centre frequency for optimum gain being 62.250. There is a local 53.032 MHz net using Pys MK 3As which he has converted, and a Weston Lowband AM rig in Lao present operators on 6 metres either mobile or base station are P29ZLN, P29VF, P29MR, P29ZVF, P29KH, P29GV and P29GA. At P29H7 Noel is making a coilformer which is hanging beside a 40 foot tower on top of a two-storey building, and has a communications receiver which has 6 metre coverage. This enables him to monitor the band between lectures. Thanks for written info, would be very pleased to hear from you again sometime.

**NEW HERIBIDES**

I note from the pages of the Geelong Amateur Radio Club bulletin that a recent visitor to their club was Ken Murray Y8KRM from New Heribides.

Ken showed a great amount of interest in six metre operation and left the club with a six metre converter and a circuit of a new beam transverter, so there may be possibilities of another area in the Pacific for next year. Ken can be contacted on most HF bands, particularly 20 metres. He is also interested in 160 metres.

**MOONBOUNCES**

Life along the Illawarra Branch of the WIA, went along his usual interesting information re their 432 MHz moonbounce activities. The following is condensed from his information, but carries all the interesting bits!

"Since last report major activity of the Group has been directed to construction of RTTY equipment in preparation for scheduled test with K3UYH. Receiving system was demonstrated at February Branch meeting, using a polar relay for teleprinter input. Circuit received from Rod VK2QJZ for constant current driver in place of polar relay, for reduction in pulse distortion. Tests to date have not yet achieved the improved results. Transmitter frequency source was modified under some difficulty by Eddie VK2ZJZ to give approximately 170 Hz shift, but frequency accuracy is not as good as with phase lock system. It is anticipated the second set of moonbounce oscillators kindly donated by John VK2AU will eventually provide close to one part in 100 million stability and accuracy and also allow FBK to a more closely controlled shift.

"Scheduled tests for 30th March were for five separate tests, and four on the 31st. Stations concerned were K3UYH, W1SL, W3WQC, W0EVE, W0DRL, W4NUS and W0Y2S, mostly newcomers to the Group. Then a request was received from G3LTF for two tests with him for the first time, just prior to him shifting QTH. His 16 foot d/h was thought to be marginal, but 800 watts output helped.

"First series of tests on 30th March resulted in only W1SL being heard. Tests then were made with G3LTF, and delighted to hear him right from the start, and were able to copy both his and our calls, and duly acknowledged by him. Chart recordings and dB meter indicated he was peaking to 5 dB or so above noise. The second contact with him on 31st was even a little better and he was sent both ways quite early in the test period. "31st March provided a CW contact with K3UYH, requests for RTTY tests were not acknowledged. The group were very pleased with the contact with G3LTF who is a long time moonbouncer on 432 and 1296 MHz, and who had previously worked only K3UYH and VET850, after repeated attempts on 432 MHz. This contact established a new 432 MHz EME distance record, eclipsing our previous record contact with K3UYH by a significant, but not yet calculated distance.

"Finally, a 60 foot dish is being re-erected by W0502, who had it dismantled and transported to another location - what a tremendous job to take on! He hopes to use it on 144, 432 and 1296 MHz EME work in about 6 months time - it will have about 6 dB more gain than the Illawarra rig (V3UYAR) has.

**6.8 MHz AUSTRALIAN RECORD**

Congratulations to Des VK2AHC, Dave VK2SB and Norm VK2ZMD for their new Australian record established on 10th February 1974. Des operated on 5960 MHz from Kurrajong Heights, while Dave and Norm operated on 5810 MHz from Balmain, Sydney, the distance being just over 58 km. FM was used and signals were 5 x 6 both ways.

26-inch long home made horn antennas were used, with 17 inch x 13 inch aperture, giving a gain of 23dB. These were fed by 3dB couplers with simple IN200 crystal diodes in the side arms. RK548 blystrons were returned and fed to ferrite isolators.

Des now hopes to produce solid state equipment for use on 3400 and 5800 MHz bands with a view of extending the operating distances for these bands during the 1975 season.

Information taken from overseas journals indicates the following distances for 5.8 GHz: England 78 Km; USA 344 Km; which is a world record established in June 1970.

**OSCAR 8**

It happened eventually. VK5LP finally had some contacts through Oscar 81 Wally VK5ZWW did a bit of prodding, so the homework was laid aside for a while, the 2 metre rig tuned up to 145.940, and fired into Oscar. Wally threatened that if I did

not work him first our period of being on speaking terms would be ended. He had no fear, the first time I didn't work anybody, and couldn't hear my own signals. Decided the rather ancient communications receiver wasn't receiving 858 on 28 MHz too well, so out came a VK3 six metre converter, coils were pruned and returned for a half meg. bandpass at 29.5 MHz, and the 2nd receiver came into life. On the next attempt I worked Wally through Oscar, as well as several other interstate stations. So we are still speaking! Some further work has been done on that excellent converter, and now it is fed into the 8 metre 858 equipment using a 24 MHz crystal to bring Oscar out on 53 MHz. The moral of this story really is that it doesn't take a lot of effort to get set up to work through Oscar, and often some gear in the shack can be altered to improve matters, a bit of incentive to get with the strength of whatever you get with, and there are the results! As time permits I shall work more stations, but the homework has first pick of the available time!

**MODEL AIRCRAFT**

I bring this unusual heading in VHF notes to your notice to any one, together with a lot of others, was perturbed to read elsewhere reports that amateurs were transmitting strong signals on the 27 MHz band and 'shooting down' model aeroplanes.

And it very hard to believe that amateurs would do this, unless they were very stupid. As usual the reports carried no information to substantiate the claims, and once again the amateurs come in for criticism without proof.

It is probably unfortunate that the model aeroplane and other crafts are allowed to operate in the 27 MHz band. Apart from the occasional amateurs who may operate there, most usage of that part of the spectrum is concerned with diathermy equipment, RF heating for industrial purposes, and of course the Citizen Band users, legal and illegal alike. A lot of the more commonly used model equipment is not dangerous and really doesn't need to be, but it does lack front-end so activity. Generally the actuators in such equipment are tone operated with the tone impressed on a carrier, and some of the simpler gear is not really critical of tone frequency, so long as it is audible. A small amateur spectrum away from the industrial, CB and amateur band would have been desirable for these experiments, many of whom are quite young, and the not-unknown include myself having done a bit of work in this direction.

All this leads up to an appeal that if any amateur has such morose tendencies to 'shoot down' model planes, please remember the heartache of a youngster who has his plane crash and be destroyed. I know young people who have spent hours on the roadside selling mushrooms, mowing lawns, doing odd jobs to get their plane and equipment together. Let us give them encouragement if only to help to keep them off the roads for a while, instead of out there killing themselves in test cases!

That's about all for this month, an enlarged version of what has been happening on the bands can generally be read in 'G UP'. I use their material at times, and they use mine, so it's a mutual operation. Think about this in the meantime. 'Each of us is like a bank that issues tolerance, confidence, kindness, love. The currency - provided it is genuine - circulates'. The Voice in the Hills.

**EMC**

It is intended that September AR will contain EMC issue . . .

Any articles on Interference and EMC generally will be gratefully received.  
Dead line - 30th June

## Contests

with Peter Brown VK4PJ

Federal Contest Manager, G.P.O. Box, 638  
Brisbane, Qld., 4001

### THE "FRIENDLY" CONTEST.

#### REMEMBRANCE DAY CONTEST

August 17th and 18th 1974

Make sure that you and your friends make this the greatest contest ever. Mark your calendar, mark your diary, and make sure that your gear is in top condition.

VHFers . . . get with it this year.

The rules will be in July 'Amateur Radio' Next month.

CW/CW contacts count double.

And this contest will count for the Contest Champion Trophy.

#### CONTEST CALENDAR

June 5th — Townsville Pacific Festival Contest.

Join in June 15th-16th — All Asian phone Contest No

details, but join in.

June 9th-10th — Massachusetts Radio Week. See

rules.

July 8th-7th — Venezuelan Contest.

July 27th-26th — County Hunters' CW Contest.

August 10th-11th — Argentina phone Contest.

August 24th-25th — All Asian CW Contest.

August 17th-18th — REMEMBRANCE DAY CONTEST

Massachusetts Amateur Radio Week

Starts 0001 GMT Sunday, June 9th.

Ends 2400 GMT Saturday, June 15th.

You will earn a certificate signed by the Governor

of Mass. If you contact 2 Mass stations.

Exchange will be signal report, state and country.

Certificates will be endorsed for band upon

request. Application by July 31st. Include a SASE

No 10, to William C. Holliday, WA1EZA, 22 Trudy

Tce., Canton, Mass. 02021.

#### CONTEST CHAMPION TROPHY

At the recent Federal Convention my offer of a

trophy, to be known as the Contest Champion

Trophy, was accepted. I have commented pre-

viously on the tremendous help to contests given

by high scorers, and this trophy is in recognition

of this help.

Although rules have yet to be published, in

essence the trophy will be for the most successful

entrant in Australian contests. I see no reason

why the next Remembrance Day Contest should

not be the first to count . . . so polish up your

gear.

#### John Moryle Memorial National Field Day

Here are some logs that were out with my

original list . . .

24 hour Section (s) VK5BR-1803,

Section (d) VK3ATO-5552,

Section (d) phone VK3AFI-2161,

8 hour Section (s) VK3ZFL-34.

So we have made a more noticeable improvement.

Some more comments . . . I note that some of

the SWLs are now showing up in contests with

call signs . . . Congratulations.

VK4WTe contest effort was all the more nota-

worthy because of the disability of a mini-cyclone

and 7 inches of rain.

Apparently through no fault of Bill VK3KO, Mid-

land Zones, VK3ATO, log was too late for inclusion

in May results . . . they had 2 ops at Mt Alexander

with an FT200, FT510, 2 X FT400s, 2 X FT10ts

and an FL100, an AWAB550 and homebrew equip-

ment.

VK3 Division again made a great effort with

most teams in the field; Canberra put some 16

operators in the field.

It was interesting to note how well the ZLs

joined in the contest this year . . . on the

occasion of their field day.

What can be done on low power . . . Russ

VK3KX mentioned that he made contacts with

VKs 2, 3, 4, 5, 6 and 7 on TWO watts CW . . .

so TVI problems.

A few comments on the rules . . . Rule 2 (e).

I did not intend that there be multiple ops here . . .

VHF ops are just starting to come into these con-

tests . . . If there are likely to be multi-op

stations, VHF only, then they will be catered for.

Most stations under 2 (d) had VHF ops. Rule 14.

This states . . . twice on each band . . . If one

contact is made whatever mode, another can be

made 4 hours later . . . Any mode . . . If a

contact is made CW/CW, I cannot see that another

contact can be made phone/phone or any other

mode, until 4 hours have elapsed.

Quite a few were penalised for making a contact

on one mode and immediately making another con-

tact on another mode.

Rule 13 and scoring for foreign portable stations.

This depends, I guess, on the honesty of the

operator . . . If the ZL or DX station is a portable

field station 15 points should be claimed

however if the other portable station is just at

another QTH with 240V rectified power supply

he should be recognised as a 'home' station.

Most contestants know what a portable field station

is??

When we get enough operators to keep the

portable field stations going perhaps we can

drop the DX contacts?

No consideration was given to HF mobiles as a

section, because of lack of interest.

Several commented on the consideration given

to VHF ops . . . but we would like to see some

response in coming contests.

By my count we had about 80 portable field

stations and about 30 ZL portable

field stations in the contest.

VK3DA tells that their new address is C/o Box

1418, Darwin, NT 5794.

Jim VK3AZT was appointed Federal Contest

Manager at the recent Convention and I trust that

he will give him at least as much help as you

have given me.

If I have not personally acknowledged your

comments please accept my thanks . . . all were

most welcome. We'll meet in contests.

I have enjoyed working for you.

#### THANKS

The Editor wishes to join with the members of

Medical Council at the Easter Convention in ex-

pressing thanks to Peter Brown, VK4PJ, for a very

good term as Federal Contest Manager. Peter did

a splendid job with his Contest work but, even

more important to me, sent regular items for the

Contests column in AR. Thank you Peter on behalf

of all members.

## Awards Column

with BRIAN AUSTIN VK5CA  
P.O. Box 74, Crafter, SA, 5182.

### CDM (CERTIFICATE MEDITERRANEO) AWARD

The award is available to licensed amateurs.

Contacts on and after 1st June 1952 are valid.

If the applicant is a member of an IARU Affiliated

Society, it is not necessary to submit QSL cards.

A list, showing full details of the contacts should

be certified by the Awards Manager of an IARU

Affiliated Society.

Non-members of an IARU Affiliated Society must

submit QSL cards to the sponsor.

The fee for the award is 10 IRCs.

The address for application is: ARI, via Sciarfatti

31, 20124 Milan, Italy.

#### Requirements

Confirmed contacts are required with 22 of the

countries shown below, plus 30 stations located

on the Italian Peninsula — Italy only

Countries list for CDM:

EA—Spain	3V—Tunisia
EAB—Balearic Islands	4X—Israel
EAB/CN3—Spanish Morocco	5A—Libya
CN3—French Morocco	5B4—Cyprus
F—France	7X/FA—Algeria
FC—Corsica	9M—Malta
I/T	
MPS	TA—Turkey
AG2—Trieste (before 1st	YK—Syria
December 1957)	YU—Yugoslavia
IS—Sardinia	ZA—Albania
IT—Sicily	2B3—Gibraltar
SU—Egypt	3A3—Monaco
ODS—Lebanon	
SV—Greece	
SV—Dodecanese Is.	
SV—Crete	

### WORKED ALL 8M 1 (WASM1)

The award is available to licensed amateurs.

Contacts after November 1945 are valid.

Do not send QSL cards. A list, showing full

details of the contacts should be certified by the

Awards Manager of a National Society.

The fee for the award is 20 IRCs (this award

is in the form of a small cloth).

The address for application is: K. Edvardsson,

SMKCE, Hålsjöstråket 43, 126 57 Hagsten, Sweden.

#### Rules:

Swedish call areas are SM1, SM2, SM3, SM4,

SM5, SM6, SM7 and SM8, SK and SL calls are

also valid. SM6 calls (Maritime Mobile) are not

valid.

#### Requirements:

Amateurs must have confirmed contacts with

ONE station in EACH of the eight call areas.

HELVETIA 22 (H22 AWARD)

The award is available to licensed amateurs.

Contacts since April 1945 are valid.

Do not send QSL cards. A list showing the call,

Country, signal reports and mode should be

certified by the Awards Manager of a National

Society.

The award is available for all CW, all phone

and mixed modes.

There is no charge for the award (it is suggested

that 2 or 3 IRCs be sent to help delay expenses.)

The address for applications is: Walter Blatter,

HB9ALF, Post Box 450, CH 6801, Locarno, Switzer-

land.

#### Requirements:

Licensed amateurs must have confirmed contacts

with one station in each of the 22 Cantons.

#### Canton list:

1. Zurich	24	12. Schaffhouse	SH
2. Bern	BE	13. Appenzel AR	AR
3. Lucerne	LU	14. St. Gall	SG
4. Uri	UR	15. Graubünden	GR
5. Schwyz	SZ	16. Argovie	AG
6. Unterwald NW	NW	17. Thurgovie	TH
7. Glarus	GL	18. Tessin	TI
8. Zug	ZG	19. Vaud	VD
9. Fribourg	FR	20. Valais	VS
10. Solothurn	SO	21. Neuchâtel	NE
11. Basel	BS	22. Genève	GE

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# Magazine Index

With Syd Clark, VK3ASC

## HAM RADIO, December 1973

A Solid 60 Watts for two Metres, Crystal Controlled AF3K Generator, Wide Range RF Signal Generator: Two-stage Audio Filter for Two Metres, Three-Terminal Voltage-Regulator IC's; Low voltage Audio AGC Amplifier; Band-pass Filter Design, Introduction to the Digital Mixer, Narrow-band Modifications for the Regency HR-2; Simple High-gain Wire Antenna for High Frequencies, Feedpoint Impedance, Characteristics of Practical Antennas, Improved Logic Test Probe.

January 1974  
CW Memory for RTTY Identification; Five-Band Kill-watt Linear, High-impedance Metre Interface, IC Logic Families, Compact Package for Two Metre FM, How to solve Transistor HeatSink Problems; Simple Lowpass Filter for Audio; Medium Power Toroidal Inductor; Tuner; Four Band High Frequency Windom Antenna.

73 MAGAZINE, January 1974  
Wide Range IC Audio Oscillator; Another IC Generator Circuit, Constructing Oscillators for 432 and 1296 MHz; Expanded Range Line Voltage Monitor; Servo Filter; Video Tape Recorders, Inexpensive decimal Counting Unit; Whistle Up a QSO; Tunable 10 Metre Converter; An IC Facsimile Receiving Converter, A Simple Touchtone Pad for Autopatch; The \$1,000 Antenna System, Special Considerations for Digital Design, Selectable Voltage Power Supply; A Versatile Code Practice Oscillator; Wriggling the nose Made Easy, Compact Mobile; Two Unbreakable Antennas for the TR-22; Leading Zero Suppression for Digital Displays; Automatic Touchtone Dialler; Newcomer and Youth Training in the DARC

February 1974  
Understanding the Slow Scan Monitor; IC Audio Amplifier; A Simple Sweep Generator for Monitor Scopes; New Regulations (1938); Quick'n Easy 15 or 20 Metre Vertical, Telephone Control and Monitor System; Modifications for Heathkit GC-1005 Digital Readout Clock; Cook a Better Circuit Board, A Variable Q Audio Filter; Another Blown Fuse Solution for Power Voltages; Building with Ten-Tec Modules; Simple Audio Pre-amp; An Integrated Circuit SWL Receiver, 432er Final Assembly, On the AIR; Transistor Keying Circuit, Low Cost Seven Segment Readout.

CG, March 1974  
The Sunspot Cycle: Worst Case Analysis; Let Your Fingers do the Talking, Plus all the usual features. QBT, January 1974  
Interdigital Converters for 1296 and 2304 MHz; A Crystal Controlled Converter and Simple Transmitter for 1750 Metre Operation: Negative and High Voltages from a Positive Supply; A 2-KW Amplifier for 144 MHz.

February 1974  
Energy Crisis: A Complete 2-Metre FM Transceiver; Recr/Coupler for Swan 500 Receivers: Construction and Use of Long Helical Coils for Antenna Loading, The HW-40 Micro Beam, Computerized Search for Secret Bridges; Improved Beam with Helical Coils 755-3B, A TTL Circuit Oscillator; A Versatile Scope for the Radio Amateur, Broadband Revisited; Public Service Input; Doing Amateur Radio Publicity from Alpha to Zulu; Oscar 7 and its Capabilities.

# 20 Years Ago

with Ron Fisher VK3OM

## JUNE 1954

At last, the Limited AOCP had arrived. The Editorial page of June Amateur Radio told the whole story of the waiting from May 1953 when the LAOCP was agreed to by the PMG.

It was announced also that all who talked in Morse Code only since January 1953 were now eligible for the Limited AOCP and could apply immediately for a certificate and licence.

Support for the LAOCP was by no means unanimous and many amateurs of the day saw it as the beginning of the end for Amateur Radio. After

all, how could one be an amateur without a knowledge of Morse code.

Trade reviews were not common in AR in those days, but one of the most significant reviews of all time was published in the June 1954 issue. The Galosco Signal Shifter model 4/101 For £10/4/9 here was the answer to the problem of designing an all-band table top transmitter. Over the next few years just about every amateur in Australia must have purchased one of these units.

Looking through the June issue of Amateur Radio the following technical articles were included. A Great Circle Monograph by A/asn Head VK3AKZ, who told how to design a great circle map and obtain bearings to all parts of the world.

Getting The Most Out of Your Receiver, a Few Hints on Proper Handling. This reprint from GST told amongst other things how to handle a crystal filter — a very misunderstood device.

National Field Day results for 1954 report that VK3AHA accepted the pool in all sections with VK3RG taking the honours in the home station section.

The Federal QSL Bureau notes written by Ray Jones VK3JRL usually contained interesting snippets of DX news. This month, the half-yearly story of the callletters sponsored Clipperton Island expedition was related.

# Letters to the Editor

Any opinion expressed under this heading is the individual concern of the writer and should not necessarily coincide with that of the Publisher.

The Editor,  
Dear Sir,  
The other evening whilst working in my shack (actually I was designing a new 1296 MHz transmitter) I was listening to one of the lower HF bands and a conversation something like the following was heard.

"VK3DOB to VK3ODE, I've been playing around with ATV on 430 MHz; you ought to try it, it's great fun."

VK3DOB to VK3DOB, I would like to give it a go, but you can't buy any gear. I think I will wait until the Japanese put some gear on the market first. I'm no good at building stuff Anyway I wouldn't know how to. I've never built any gear before and I don't think I would like to start now."

This type of conversation appears typical of that which can be heard around the bands especially on the HF bands.

I would like to know what is the modern radio amateur coming to?

I think all radio amateurs should read the extract from EEB in April 1974 Amateur Radio. The statements made there are very typical at the present time.

It is about time that Australian radio amateurs, in fact ALL radio amateurs, forgot some of their 20 metre and other shams and did a little experimenting and building, and let everybody know that the modern radio amateur is not just an operator of a little black box that he has purchased from Joe Blow up the street for \$4,000 cents, and that three element beam which cost 3,500 cents could have been built for only 10 dollars if he had only thought before spending.

I hope this puts a little inspiration into the heads of a few Amateurs. If it does the time spent writing this letter has been well spent.

Cyril Maude, VK3ZGK

# Key Section

with Deane Blackman VK3TX

Box 362, Clayton, Vic., 3168

This month's notes are devoted to one topic, and that is a proposal to introduce a scheme whereby overseas amateurs can become associate members of the Key Section. They cannot become full members because under the constitution of the Key Section, membership is restricted to holders of VK licences.

This proposal has been under discussion by the divisional co-ordinators for some time, and has

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Teletype Model 15 T07B, 50 Baud. KBD. PTH. Recently overhauled. \$85. VK3AWM, QTHR (Canberra) Ph. A.H. (03) 792 3475.

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Copies of QBT or 73 for the years 1970 to 1974. Please quote prices wanted, freight paid this end. VK3KE QTHR.

VK3 2 metre Transceiver. Details, price, etc. to VK3OB QTHR but Postcode 2288.

Hamlicators 827/836 Receiver. R. Graham, VK2ZQJ QTHR (02) 842-1212.

BC221 Frequency Meter preferably in full going condition. OR — digital frequency meter to 30 MHz. AR7 Rx in any condition provided dial, gang, IFTs and valve sockets are OK — preferably with all coil boxes. Send prices and details to VK3Z1J QTHR Ph. (03) 89 4645.

Back issues of A.R. April '73, July '78. All 1988 and earlier Pre-arranged in good condition as they are for binding into volume form. Write price and condition or send to VK3ZME Martin Hood, 7/40 High St., Randwick.

been accepted in principle by the Federal Executive of the Institute. However, because its operation will touch you if you work DX on CW (at least I think it will), I thought it best to let you know what we have in mind if you have any strong thoughts let me know about them before June 30.

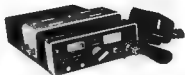
We are proposing to offer associate membership to overseas amateurs who work 20 members of the Key Section. All Members of the Section have a membership number, and applicants for associate membership would have to quote this number in their log extract when applying. It is proposed to give all associates a certificate.

This is in many ways a rather modest enterprise, but it has the same motivation as the rules for local amateurs, namely, to offer encouragement to people to enjoy CW operating irrespective of ability. All going well, I would hope the plan to start in 1975.

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4-16	1	16	No 3015	\$1.19
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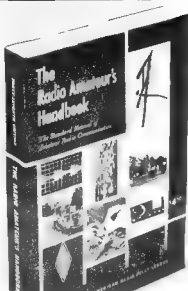
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References A R R L Handbook 196  
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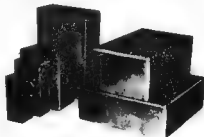
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AC104	80	30	AV153	150	1.00	BC111	150	45	NA2208	2.20	2.00	2N1712	50	48
AC105	80	30	AV154	150	1.00	BC112	150	45	NA2209	2.20	2.00	2N1713	50	48
AC106	80	30	AV155	150	1.00	BC113	150	45	NA2210	2.20	2.00	2N1714	50	48
AC107	80	30	AV156	150	1.00	BC114	150	45	NA2211	2.20	2.00	2N1715	50	48
AC108	80	30	AV157	150	1.00	BC115	150	45	NA2212	2.20	2.00	2N1716	50	48
AC109	80	30	AV158	150	1.00	BC116	150	45	NA2213	2.20	2.00	2N1717	50	48
AC110	80	30	AV159	150	1.00	BC117	150	45	NA2214	2.20	2.00	2N1718	50	48
AC111	80	30	AV160	150	1.00	BC118	150	45	NA2215	2.20	2.00	2N1719	50	48
AC112	80	30	AV161	150	1.00	BC119	150	45	NA2216	2.20	2.00	2N1720	50	48
AC113	80	30	AV162	150	1.00	BC120	150	45	NA2217	2.20	2.00	2N1721	50	48
AC114	80	30	AV163	150	1.00	BC121	150	45	NA2218	2.20	2.00	2N1722	50	48
AC115	80	30	AV164	150	1.00	BC122	150	45	NA2219	2.20	2.00	2N1723	50	48
AC116	80	30	AV165	150	1.00	BC123	150	45	NA2220	2.20	2.00	2N1724	50	48
AC117	80	30	AV166	150	1.00	BC124	150	45	NA2221	2.20	2.00	2N1725	50	48
AC118	80	30	AV167	150	1.00	BC125	150	45	NA2222	2.20	2.00	2N1726	50	48
AC119	80	30	AV168	150	1.00	BC126	150	45	NA2223	2.20	2.00	2N1727	50	48
AC120	80	30	AV169	150	1.00	BC127	150	45	NA2224	2.20	2.00	2N1728	50	48
AC121	80	30	AV170	150	1.00	BC128	150	45	NA2225	2.20	2.00	2N1729	50	48
AC122	80	30	AV171	150	1.00	BC129	150	45	NA2226	2.20	2.00	2N1730	50	48
AC123	80	30	AV172	150	1.00	BC130	150	45	NA2227	2.20	2.00	2N1731	50	48
AC124	80	30	AV173	150	1.00	BC131	150	45	NA2228	2.20	2.00	2N1732	50	48
AC125	80	30	AV174	150	1.00	BC132	150	45	NA2229	2.20	2.00	2N1733	50	48
AC126	80	30	AV175	150	1.00	BC133	150	45	NA2230	2.20	2.00	2N1734	50	48
AC127	80	30	AV176	150	1.00	BC134	150	45	NA2231	2.20	2.00	2N1735	50	48
AC128	80	30	AV177	150	1.00	BC135	150	45	NA2232	2.20	2.00	2N1736	50	48
AC129	80	30	AV178	150	1.00	BC136	150	45	NA2233	2.20	2.00	2N1737	50	48
AC130	80	30	AV179	150	1.00	BC137	150	45	NA2234	2.20	2.00	2N1738	50	48
AC131	80	30	AV180	150	1.00	BC138	150	45	NA2235	2.20	2.00	2N1739	50	48
AC132	80	30	AV181	150	1.00	BC139	150	45	NA2236	2.20	2.00	2N1740	50	48
AC133	80	30	AV182	150	1.00	BC140	150	45	NA2237	2.20	2.00	2N1741	50	48
AC134	80	30	AV183	150	1.00	BC141	150	45	NA2238	2.20	2.00	2N1742	50	48
AC135	80	30	AV184	150	1.00	BC142	150	45	NA2239	2.20	2.00	2N1743	50	48
AC136	80	30	AV185	150	1.00	BC143	150	45	NA2240	2.20	2.00	2N1744	50	48
AC137	80	30	AV186	150	1.00	BC144	150	45	NA2241	2.20	2.00	2N1745	50	48
AC138	80	30	AV187	150	1.00	BC145	150	45	NA2242	2.20	2.00	2N1746	50	48
AC139	80	30	AV188	150	1.00	BC146	150	45	NA2243	2.20	2.00	2N1747	50	48
AC140	80	30	AV189	150	1.00	BC147	150	45	NA2244	2.20	2.00	2N1748	50	48
AC141	80	30	AV190	150	1.00	BC148	150	45	NA2245	2.20	2.00	2N1749	50	48
AC142	80	30	AV191	150	1.00	BC149	150	45	NA2246	2.20	2.00	2N1750	50	48
AC143	80	30	AV192	150	1.00	BC150	150	45	NA2247	2.20	2.00	2N1751	50	48
AC144	80	30	AV193	150	1.00	BC151	150	45	NA2248	2.20	2.00	2N1752	50	48
AC145	80	30	AV194	150	1.00	BC152	150	45	NA2249	2.20	2.00	2N1753	50	48
AC146	80	30	AV195	150	1.00	BC153	150	45	NA2250	2.20	2.00	2N1754	50	48
AC147	80	30	AV196	150	1.00	BC154	150	45	NA2251	2.20	2.00	2N1755	50	48
AC148	80	30	AV197	150	1.00	BC155	150	45	NA2252	2.20	2.00	2N1756	50	48
AC149	80	30	AV198	150	1.00	BC156	150	45	NA2253	2.20	2.00	2N1757	50	48
AC150	80	30	AV199	150	1.00	BC157	150	45	NA2254	2.20	2.00	2N1758	50	48
AC151	80	30	AV200	150	1.00	BC158	150	45	NA2255	2.20	2.00	2N1759	50	48
AC152	80	30	AV201	150	1.00	BC159	150	45	NA2256	2.20	2.00	2N1760	50	48
AC153	80	30	AV202	150	1.00	BC160	150	45	NA2257	2.20	2.00	2N1761	50	48
AC154	80	30	AV203	150	1.00	BC161	150	45	NA2258	2.20	2.00	2N1762	50	48
AC155	80	30	AV204	150	1.00	BC162	150	45	NA2259	2.20	2.00	2N1763	50	48
AC156	80	30	AV205	150	1.00	BC163	150	45	NA2260	2.20	2.00	2N1764	50	48
AC157	80	30	AV206	150	1.00	BC164	150	45	NA2261	2.20	2.00	2N1765	50	48
AC158	80	30	AV207	150	1.00	BC165	150	45	NA2262	2.20	2.00	2N1766	50	48
AC159	80	30	AV208	150	1.00	BC166	150	45	NA2263	2.20	2.00	2N1767	50	48
AC160	80	30	AV209	150	1.00	BC167	150	45	NA2264	2.20	2.00	2N1768	50	48
AC161	80	30	AV210	150	1.00	BC168	150	45	NA2265	2.20	2.00	2N1769	50	48
AC162	80	30	AV211	150	1.00	BC169	150	45	NA2266	2.20	2.00	2N1770	50	48
AC163	80	30	AV212	150	1.00	BC170	150	45	NA2267	2.20	2.00	2N1771	50	48
AC164	80	30	AV213	150	1.00	BC171	150	45	NA2268	2.20	2.00	2N1772	50	48
AC165	80	30	AV214	150	1.00	BC172	150	45	NA2269	2.20	2.00	2N1773	50	48
AC166	80	30	AV215	150	1.00	BC173	150	45	NA2270	2.20	2.00	2N1774	50	48
AC167	80	30	AV216	150	1.00	BC174	150	45	NA2271	2.20	2.00	2N1775	50	48
AC168	80	30	AV217	150	1.00	BC175	150	45	NA2272	2.20	2.00	2N1776	50	48
AC169	80	30	AV218	150	1.00	BC176	150	45	NA2273	2.20	2.00	2N1777	50	48
AC170	80	30	AV219	150	1.00	BC177	150	45	NA2274	2.20	2.00	2N1778	50	48
AC171	80	30	AV220	150	1.00	BC178	150	45	NA2275	2.20	2.00	2N1779	50	48
AC172	80	30	AV221	150	1.00	BC179	150	45	NA2276	2.20	2.00	2N1780	50	48
AC173	80	30	AV222	150	1.00	BC180	150	45	NA2277	2.20	2.00	2N1781	50	48
AC174	80	30	AV223	150	1.00	BC181	150	45	NA2278	2.20	2.00	2N1782	50	48
AC175	80	30	AV224	150	1.00	BC182	150	45	NA2279	2.20	2.00	2N1783	50	48
AC176	80	30	AV225	150	1.00	BC183	150	45	NA2280	2.20	2.00	2N1784	50	48
AC177	80	30	AV226	150	1.00	BC184	150	45	NA2281	2.20	2.00	2N1785	50	48
AC178	80	30	AV227	150	1.00	BC185	150	45	NA2282	2.20	2.00	2N1786	50	48
AC179	80	30	AV228	150	1.00	BC186	150	45	NA2283	2.20	2.00	2N1787	50	48
AC180	80	30	AV229	150	1.00	BC187	150	45	NA2284	2.20	2.00	2N1788	50	48
AC181	80	30	AV230	150	1.00	BC188	150	45	NA2285	2.20	2.00	2N1789	50	48
AC182	80	30	AV231	150	1.00	BC189	150	45	NA2286	2.20	2.00	2N1790	50	48
AC183	80	30	AV232	150	1.00	BC190	150	45	NA2287	2.20	2.00	2N1791	50	48
AC184	80	30	AV233	150	1.00	BC191	150	45	NA2288	2.20	2.00	2N1792	50	48
AC185	80	30	AV234	150	1.00	BC192	150	45	NA2289	2.20	2.00	2N1793	50	48
AC186	80	30	AV235	150	1.00	BC193	150	45	NA2290	2.20	2.00	2N1794	50	48
AC187	80	30	AV236	150	1.00	BC194	150	45	NA2291	2.20	2.00	2N1795	50	48
AC188	80	30	AV237	150	1.00	BC195	150	45	NA2292	2.20	2.00	2N1796	50	48
AC189	80	30	AV238	150	1.00	BC196	150	45	NA2293	2.20	2.00	2N1797	50	48
AC190	80	30	AV239	150	1.00	BC197	150	45	NA2294	2.20	2.00	2N1798	50	48
AC191	80	30	AV240	150	1.00	BC198	150	45	NA2295	2.20	2.00	2N1799	50	48
AC192	80	30	AV241	150	1.00	BC199	150	45	NA2296	2.20	2.00	2N1800	50	48
AC193	80	30	AV242	150	1.00	BC200	150	45	NA2297	2.20	2.00	2N1801	50	48
AC194	80	30	AV243	150	1.00	BC201	150	45	NA2298	2.20	2.00	2N1802	50	48
AC195	80	30	AV244	150	1.00	BC202	150	45	NA2299	2.20	2.00	2N1803	50	48
AC196	80	30	AV245</											



# NOVEMBER 1973—Continued

VK3YHP—H. J. Payne, 37 Palaroo Street, Swan Hill, 3585.  
 VK3ZCQ—M. R. Osborne, 46 Nirrings Avenue, Aspendale, 3185.  
 VK3ZIM—A. S. Wadsworth, 18/9 Latrobe Street, Mentone, 3184.  
 VK3ZQU—J. T. Craigie, 45 Heatherdale Road, Ringwood, 3134.  
 VK3ZRV—C. G. Weir, 221 St. Helena Road, Greensborough, 3086.  
 VK3ZYV—J. Morris, Change postcode to 3035.  
 VK3ZYO—T. P. Cowley, 10 Alban Street, Clifton Hill, 3065.  
 VK3ZYV—J. Morris, 8/370 Riverside Road, Camberwell, 3124.

## QUEENSLAND

VK4KY—M. J. Y. McCartney, Flat 3, 66 Best Street, Yarraby Knob, 4871.  
 VK4MY/T—J. R. Martin, Presbyterian Manse, Fincert Hutton, 4741.  
 VK4TU—K. W. Collins, Station: 8 Cook Street, Goodwood, 4360.  
 Postal: P.O. Box 238, Goodwood, 4360.  
 VK4ZLY—L. R. Varro, M/8 184 Gellon, 4543.  
 VK4ZXS—J. McCarthy, 4/18 Street, Galilee, 4300.  
 VK4ZLI—A. G. Linning, 14 Augustus Street, Corinda, 4075.  
 VK4ZMP—A. P. Moody, 992 South Pine Road, Everton Hills, 4055.  
 VK4ZSD—L. B. Dmifraff, 6 Grenville Street, Biloela, 4715.

## SOUTH AUSTRALIA

VK5PW—P. W. Riedel, 20 Ways Road, Menningham, 5008.

## WESTERN AUSTRALIA

VK5HD—M. E. Bazley, 8 James Road, Kalamunda, 5076.  
 VK5OE—A. W. Storm, Charles Village Mobile Home, Warraroo Road, Wanneroo, 6055.  
 VK5WY—W. G. Wyika, 88 Evans Street, Shenton Park, 6008.  
 VK5ZDY—J. Jackson, 90 Anzac Terrace, Essendon, 3040.

## TASMANIA

VK7CD—C. A. Danforth, 3 Leonard Court, Ocean View, Burnie, 7350.  
 VK7GJ—G. G. Johnston, Main Road, Ouse, 7461.  
 T.P.N.G.  
 VK7HF—Rev. H. J. Fischer, Station: Capital, Manus Island.  
 Postal: P.O. Box 146, Loreauau.

## GALEND

VK3FJ—C. R. Nelson, Now VK3JWC.  
 VK3ZT—M. Matthews, Not renewed.  
 VK3ABQ—F. G. Voight, Not renewed.  
 VK3ZNO—R. A. Jones, Now VK3WGL.  
 VK3ALV—K. A. Palliser, Now VK3GJ.  
 VK3SBJ—R. C. Liss, Now VK3VO.  
 VK3YDJ—J. J. Jarvis, Not renewed.  
 VK3YDV—G. B. Pritchard, Not renewed.  
 VK3ZCS—G. G. Baker, Transferred to South Australia.

## QUEENSLAND

VK4GG—G. Heilbronn, Deceased.  
 VK4OG—Gold Coast Radio Club, See VK4WVG.  
 VK4ZLV—R. J. Williams, See VK4UJ.  
 VK4ZKV—R. H. Kyle, See VK4YE.  
 VK4ZRL—L. R. Reseck, See VK4EEN.  
 SOUTH AUSTRALIA  
 VK5OW—B. E. Beckmen, Not renewed.  
 VK5UT—P. F. Allen, Not renewed.  
 VK5ZPA—P. A. Reichelt, Not renewed.  
 VK5ZKZ—W. S. Barnes, Not renewed.

## WESTERN AUSTRALIA

/K5OM—R. C. Marschke, Transferred to ACT.  
 TASMANIA  
 VK7FM—T. F. Moore, 23 McGuinness Crescent, Leneah Valley (Non renewal of licence), 7006.  
 VK7ZAR—R. A. J. Reynolds, 46 Jennings Street, New Town (Transferred to Victoria), 7008.  
 T.P.N.G.

VK8LP—L. Pedrini, Station: Portable throughout PNG.  
 Postal: P.O. Box 88, Lae.  
 VK8AV—E. V. Avenell, Station: St. Michael's Estate, Kieta.  
 Postal: P.O. Box 101, Kieta, Bougainville.

## NEW STATIONS — DECEMBER 1973

AUSTRALIAN CAPITAL TERRITORY  
 VK1JR—J. R. Watson, 161 Brigalow St., Lyneham, 2602.  
 1TH—E. W. Howell, 130 Sandjalong Cr., Aranda, 2614.  
 1YL—M/S S. Britton, 27 Galway Pl., Deakin, 2600.

## NEW SOUTH WALES

VK2SB—D. I. Ralph, 7 Altona Ave., Forestville, 2057.  
 2AGY—A. de H. Christy, 218 Kelly St., Scone, 2357.  
 2AGM—G. R. Molloy, 1 Onslow St., Rosebay, 2028.  
 2ALY—A. R. Stuart, 10 Wanganelia St., Belconnen, 2093.  
 2ANC—T. Clendon, 19 Benewarra Ave., Baulkham Hills, 2153.  
 2BSG—J. M. Potts, 14 John Street, Woonona, 2517.  
 2BCR—C. Rushby, 11 Edgewood St., Leichhardt, 2040.

2BCX—R. A. Bee, 30 Prince St., Glenbrook, 2773.  
 2BDD—J. Rooks, 5/46 Fontainebleau St., Sans Souci, 2218.  
 2BGO—G. W. Henshaw, 386 Heath St., Albury, 2940.  
 2BLI—L. Lees, 14 Copeland St., Richmond, 2753.  
 2BNZ—J. Mouritzen, 37 Fourth Ave., Wollongong, 2508.  
 2BRU—R. James, 34 William St., Hornsby, 2077.  
 2BRN—R. N. Biale, 32 Lynwood Av., Killara, 2071.  
 2YBN—J. B. Scott, 13 Giffing Ave., Vaucluse, 2030.  
 2YBO—P. Fitzpatrick, 20 Figtree Ave., Randwick, 2031.  
 2ZEZ—G. W. Evans, 282 Morrison Rd., Ryde, 2112.  
 2ZJW—A. J. Walker, 99 Labradore St., Ruffy Hill, 2786.  
 2ZMX—J. Moodie, 31 Mevis Ave., Peakhurst, 2110.

## VICTORIA

VK3FB/T—L. E. Seal, 21 Wade Lane, Goldam Square, 3650.  
 3XB—D. B. Mundie, 112 Blackburn Rd., East Doncaster, 3100.  
 3APJ—E. W. Martin, 8 Arthur St., Mt. Beauty, 3680.  
 3BAW—H. D. Hanson, Unit 4, 35 Riverside Rd., Hawthorn, 3181.  
 3BCE—D. E. Hill, Cnr. Riverside Ave. & Elsworth St., Mildura, 3600.  
 3BLI—W. G. Maddam, 11 Wilson St., Fernside, 3156.  
 3BKW—K. R. White, 58 Charles St., Ascot Vale, 3032.  
 3BOH—O. H. Eva, 5 Kennedy Rd., Shepparton, 3620.  
 3YBL—W. A. Lyon, 97 Eglinton St., Moonee Ponds, 3038.  
 3YCA—D. C. Arnold, 6 Russell St., Camberwell, 3124.  
 3YDJ—C. J. Janvic, Beauport Ave., Ballarat, 3350.  
 3YDM—M. Robinson, 935 Dorset Rd., Boronia, 3125.  
 3YDW—D. P. Sharples, 79 St. Albans Ave., Box Hill, 3129.

3YHC—K. A. Ayton, 145 Sunahine Rd., Tottenham, 3012.  
 3YHI—K. I. Woods, 31 Glen Iris Rd., Camberwell, 3124.  
 3YHW—M. A. Sharples, 79 St. Albans Ave., Box Hill, 3129.  
 3YJW—J. L. Wickham, 186 Punt Rd., Prahran, 3181.  
 3ZDA—A. E. Hiecock—1A Parker St., Springvale, 3172.  
 3ZEF—C. D. Baldock, 71 Enfield Ave., Park Orchards, 3161.  
 3ZFC—A. D. Buck, 263 Gooch St., Thornbury, 3071.  
 3ZGA—G. H. Apperley, 22 McCracken Ave., Northcote, 3070.  
 3ZJH—D. W. Horsey, 12 Palmerston St., Bendigo, 3550.  
 3ZJK—A. J. Underhill, 44 Knox St., Reservoir, 3023.  
 3ZJN—T. J. Jones, 5 The Broadway, Nth. Altona, 3025.  
 3ZKN—A. E. Mollows, 20 Deakin Cres., Dandenong, 3175.  
 3ZOD—O. G. Schmidt, 79 Frankham Rd., Ashburton, 3147.  
 3ZPG—S. A. Barnham, 97 Esplanade, Altona, 3018.  
 3ZPH—P. A. Hicks, 28 Harrison St., Mitcham, 3132.  
 3ZPT—M. Paget, 11 Johnstone St., Broadmeadows, 3047.  
 3ZQV—M. J. McDonald, 60 Arksrings Cres., Blackburn, 3130.  
 3ZSR—S. H. Riley, 9/33 Evans St., Wangaratta, 3677.  
 3ZTT—G. L. Sneddon, 20 Vermont St., Glen Waverley, 3150.  
 3ZUD—O. Dickinson, 13 White St., Mt. Waverley, 3146.  
 3ZUM—J. G. Jones, 2/25 Collin Rd., 8th. Oakleigh, 3167.  
 3ZVU—D. C. Hunt, 28 High St., Mont Albert, 3127.  
 3ZZI—D. W. Summer, 8 Michael St., Bendigo, 3550.

## NEW HEBRIDES CONDOMINIUM

### require

## A RADIO TECHNICIAN

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- (1) H.F. & S.S.B. Transmitters, receivers and associated equipment
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- (3) Broadcast transmitters
- (4) Telex systems including error correcting equipment
- (5) V.H.F. Systems both Land and Marine
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APPLICANTS Must possess Electronic Technicians Certificate, O.N.C. or H.N.C. in Telecommunications, (UK) City & Guilds Final Certificate in Telecommunications or equivalent.

SALARY: A\$ 2940-\$3460 according to experience — there is no income tax. Children's allowances. Three-year contract with gratuity.

For further details apply:

CROWN AGENTS, 54 CARRINGTON STREET, SYDNEY 2000

# QUEENSLAND

- VK4WC—G. A. Glapp, 50 Malinda Dr., Palm Beach 4221.  
 4ZJT—J. Langbume, 25 Barcelona St., Kirwan 4514.  
 4ZLL—L. E. Ashdown, 62 Monterey St., Wacol 4078.  
 4ZVC—P. V. Cunningham, 228 Toombul Rd., Northgate 4013.  
 4ZSR—R. W. Rigg, 15 Greville Ave., Southport 4215.

# SOUTH AUSTRALIA

- VK5ZOG—D. A. Morrie, 21 Mantilla Rd., Salisbury North 5108.  
 5ZGS—G. K. Bills, 18 Keith Ave., Nth. Plympton 5037.  
 5ZSR—R. R. Wade, 13 Deepdene Ave., Mitchell Park 5043.  
**WESTERN AUSTRALIA**  
 VK5HA—A. H. van den Avort, 23 Slade St., Bayswater 6053.  
 6TZT—D. V. Robinson, 25 Chalfield St., Gosnells 6110.

# TASMANIA

- VK780—S. Gludiel, 109 Lansdowne Cres., West Hobart 7000.

# NORTHERN TERRITORY

- VK8BA—T. A. Bachman, 25 Habbett Crea., Alice Springs 5752.  
 6CEG—G. N. Vayro, RAAP Base, Darwin 5790.

# CHANGE OF ADDRESS

# NEW SOUTH WALES

- VK2YBP—D. B. Poulton, 22 Beecroft Rd., Beecroft 2118.

# VICTORIA

- VK3DH—L. Morgan, Change of Postal Code to 3128.  
 3AGT—F. R. Berber, 13 Harrison St., Ringwood 3134.  
 3ABV—T. E. Straughair, 18 Capricorn Ave., East Doncaster 3108.  
 3AGJ—L. N. Hoeking, 8 Nymph St., Mitcham 3153.  
 3ABY—W. N. Guy, 4 St. Thomas Ave., Warringa 3152.  
 3YHJ—M. J. Ross, 708 Malvern Rd., Armadale 3145.  
 3ZHX—H. E. Jones, 22 Soren St., Frankston 3199.  
 3ZMV/T—R. A. Kellock, Unit 10, 7 Kaniworth Pde., Ivanhoe 3078.

# QUEENSLAND

- VK4DY—M. T. Deskin, Bouldercombe via Mt. Morgan 4714.  
 4QV—K. B. Pounsett, 33 Lasseter St., Kedron 4031.

# SOUTH AUSTRALIA

- VK5LT—J. D. Church, Fl. 6/149 Lipsett Ter., Brooklyne Park 5032.

# WESTERN AUSTRALIA

- VK8ZGW—K. J. Chipper, "Yallambee" Hedges Rd., Glen Forrest 6071.  
 6ZBQ—E. J. Barbara, Station: Flat D, Lot 491 Loch St., Derby 6726; Postal: C/- Derby Regional Hospital, Derby 6728.

# CANCELLATIONS

# VICTORIA

- VK3AAB—Army Apprentices School, Balmcombe. Not renewed.

- 5APL—J. T. Cunningham. Not renewed.  
 5AYC—R. P. Caudell. Not renewed.  
 3BGU—L. Sembell. Not renewed.  
 3ZEW—P. Etoude. Not renewed.  
 3ZWM—D. E. Hill. Now VK3BCE.  
 3ZKV—R. J. Paretel. Not renewed.  
 3ZXT/T—L. E. Stael. Now VK3PBT.

# QUEENSLAND

- VK4WO—A. H. Tiler. Decided.  
 4ZDH—R. P. L. Hunt. R. E. Not renewed.  
 4ZGK—G. K. King. Not renewed.  
 4ZRN—R. L. Neilson. Not renewed.

# SOUTH AUSTRALIA

- VK5OW—P. A. Dennison. Not renewed.

# WESTERN AUSTRALIA

- VK6N—G. E. Nixon-Smith. Not renewed.  
 6SV—K. E. Pledger. Not renewed.  
 6WFF—W. Wazynski. Not renewed.  
 6HY—H. K. F. Van. Not renewed.  
 6ZAH—J. F. Chambers. Not renewed.  
 6ZHA—A. H. van den Avort. Not renewed.  
 6ZTF—E. J. Robinson. Not renewed.

# PERMISSION TO CONDUCT TV EXPERIMENTS

- VK6TO/T—B. J. Blaby, 1 Amanda Way, Morphett Vale 5152, GA.

- 5ZTT/T—P. M. S. Birrell—Brigadeone Tolmers Rd., Mt. Gambier, SA.

# NEW STATIONS—JANUARY 1978

# AUSTRALIAN CAPITAL TERRITORY

- VK1DW—D. H. Wadkins, 1 Friendship St., Red Hill 2603.  
 1ZKB—K. C. Barnes, 2/27 Gamor St., Waramanga 2611.

# NEW SOUTH WALES

- VK2RR—A. A. A. Mottings—40 Woodland St., Balgownie 2093.  
 2AJW—J. W. Williams, Block 423, Mourmoung 2046.  
 2AZJ—J. W. Faulkner, 10 Lily St., Croydon Park 2153.  
 2BBQ—N. L. Kinch, 11/02 Soldiers Ave., Harbor 2096.  
 2BKZ—J. W. Daniel, 83 Chisholm Rd., Auburn 2144.  
 2BP1—Maitland Postal Institute Radio Club, Day St., East Maitland 2325.  
 2SWZ—W. E. Purner, 3 Thomas St., Balmrain 2041.  
 2BYW—C. W. Brown, 20 Orange St., Eastwood 2122.  
 2BYO—A. R. Chappie, 1 Mimosa Rd., Turramurra 2074.  
 2YBR—D. A. Crofts, 83 Grandview Rd., New Lambton Heights 2305.  
 2YBS/T—G. C. Snell, 305 High St., Cheshwood 2087.  
 2YBW—J. R. Pollard, "Inseln" RMB 405 Ours Rd., via Wagga 2650.  
 2YBY/T—J. O. Wightman, 16/57 Eddystone Rd., Berley 2207.  
 2YBZ—D. B. Coffee, 16 Werona St., North Lambton 2298.  
 2YCA—R. B. Carter, 121 Victoria Rd., West Pennant Hills 2120.  
 2YCB—T. I. Clarke, 7/100 Pacific Pde., Dee Why 2099.  
 2YCG—J. C. Campbell, 4 Tooka St., Newcastle 2300.  
 2ZAF—T. K. Austin, Univ. Hall 281 Parramatta Rd., Glabe 2037.

# VICTORIA

- VK3XO—W. H. Kelly, 6 Edwin St., Bendigo 3560.  
 3AHF—H. P. Helms, 12/53 Grange Rd., Toorak 3142.  
 3ANO—S. R. Brooks, 6 Edger Cl., Farnes Gully 3150.  
 3AXI—R. A. Heron, 26 Ivanhoe St., Glen Waverley 3150.  
 3BGZ—R. C. Beng, 10/46 Caroline St., South Yarra 3141.  
 3BHY—H. K. Vuna, 12/37 Hope St., South Yarra 3141.  
 3YKT—T. Harkness, 38 Dunblane St., Noble Park 3174.  
 3YJE—G. C. Wood, 8 Rose St., Ascendale 3185.  
 3YJH—J. H. Harvey, 4 Hillview St., Bendigo 3560.  
 3ZJF—F. R. Swinerton, 12 Grimsbury St., Greensborough 3088.  
 3ZLM—J. J. Smith, 1 Emma St., 5th Caulfield 3162.  
 3ZML—P. M. Higgins, 1025 Glenhenty Rd., 8th. Caulfield 3162.  
 3ZPC—S. L. Coed, 38 Kevin Ave., Farnes Gully 3158.  
 3ZPW—P. C. Chadwick, 12 Talbot Ave., Balwyn 3105.  
 3ZQO—L. Stone, 7 McKinnon Rd., McKinnon 3204.

# QUEENSLAND

- VK40J—J. S. Stant, Permanent Mobile.  
 4PJ—W. R. Pools, 277 Charles St., Alkenvale 4814.  
 4PY—J. K. McCarthy, PO Box 168, Surfers Paradise 4217.  
 4YI—P. A. Pender, 4 Donna Ave., Rochdale 4213.  
 4YJ—R. F. Woolley, 19 Alkaba St., Banyo 4014.  
 4ZDB—D. F. Adenson, 157 Eyre St., Nth. Ward 4810.  
 4ZRF—A. Downie, 2 Inge St., Mt. Gravatt 4122.

# SOUTH AUSTRALIA

- VK5BA—M. R. Hestard, 54 Malvern Ave., Malvern 5051.  
 5KGJ/T—J. F. Ingham, 74 Fisher St., Fullarton 5063.  
 5MD—R. Buty, 43 HMAS Australia Rd., Henley Beach 5023.  
 5VG—W. D. Gaines, Wallaroo Airport, Wallaroo 5330.

- 5WQ—W. C. Wilkinson, 13 Donald St., Highbury 5058.  
 5XK—R. W. Worden, 14 Thomas St., Unley 5061.  
 5ZG—G. L. Stephens, 68 Sanson Rd., Semaphore 5018.  
 5ZCH—A. J. Chalmer, PO Box 83, Mt. Gambier 5290.  
 5ZJD—J. D. Bishop, 10 Fraser St., Lower Mitcham 5062.  
 5ZLN—J. Chalmers, 12 Talbot Ave., Nth. Plympton 5057.  
 5ZPD—D. D. Berry, 19 Wilson Rd., Gilles Plains 5084.  
 5ZWC—W. C. Coates, 4 Malone St., Millcent 5280.

# WESTERN AUSTRALIA

- VK6AI—G. N. Marks, 72 The Grange, Tranby Park, Well St., Maylands 6001.  
 6XD—D. L. Hall, 73 Cleveland St., Dianella 6062.  
 6CI—W. R. Cook, 30 River Dr., Pinjarra 6208.  
 6GH—G. E. Nixon, 69 Haig Rd., Attadale 6166.  
 6JG—G. Meers, 8 Coates Street, Hamilton Hill 6113.  
 6ZJP—W. W. Jupp, 48 Kooyong Rd., Rivervale 6103.

# TASMANIA

- VICUV—R. B. Greenwood (Name changed from R. S. Trollope), 25 Prospect St., Launceston 7280.  
 7ZDX—D. M. J. Bates (transferred from SA), 19 Browns Rd., Kingston 7160.  
 7ZYT—G. B. Taylor (transferred from Vic.), 4/7 Una St., Mt. Stuart 7000.

# NORTHERN TERRITORY

- VK7HM—G. E. Anderson, 60 Bloomfield St., Alice Springs 5760.

# CHANGE OF ADDRESS

# NEW SOUTH WALES

- VK2ZOA—W. P. Hamon, 19/30 Cambridge St., Stanmore 2048.

# VICTORIA

- VK3FF—P. J. Fitzherbert, 115 Barnabool Rd., High-ton 3216.  
 3GE—L. R. Wade, 23 Lawson Ave., Frankston 3199.  
 3QJ—W. H. Tullihill, 78 Maroney St., Balmadale 3605.  
 3TR—L. C. Sawyer, 6 Hainthorpe Gr., Mulgrave 3170.  
 3TV—A. C. Styles, Pascoe St., Avoca 3487; Postal Address: PO Box 86, Avoca.  
 3XG—W. H. Richardson, 79 Devon Rd., Pascoe Vale 3044.  
 3AFX—R. Hoacking, 27 Foots St., Elwood 3184.  
 3AQD—F. C. N. Glenville, 23 Falcon Rd., Moleod 3085.  
 3AQV—J. N. Glenville, 23 Falcon Rd., Moleod 3085.  
 3ABN—A. J. Asender, 31 Calista St., Doncaster 3109.  
 3AVK—N. O. Duncan, 18 Sherbrooke Ave., Ringwood 3134.  
 3BEI—B. Lukas, 3 Mul St., Mt. Waverley 3149.  
 3BGK—S. L. Spryde, 49 Koorling Rd., Uppery 3158.  
 3YAD—A. W. Biddle, Lot 7, 7 Tarilla Dr., Launching Place 3139.  
 3YBP—T. Robinson, 16 Parrang Rd., Balwyn 3104.  
 3YCK—J. M. Wiseman, 40 Gardella St., Horeham 3400.  
 3ZJF—A. M. Tilley, 521 Glenierie Rd., Hawthorn 3122.  
 3ZIL—P. A. Elton, 26 Abercrombie St., Deepdene 3103.  
 3ZIO—D. A. Fraser, 4 Stablesford Ave., Glen Waverley 3150.  
 3ZOO—C. G. Schmidt, 32 Brentwood Dr., Glen Waverley 3150.  
 3ZXY—T. J. Leith, 2/26 Grandview Gr., East Prahan 3181.

# QUEENSLAND

- VK4IN—J. R. Horrocks, 18 Greville Dr., Burligh Heads 4220.  
 4IL—L. F. Caylor, 180 Shearman Ave., North Rockhampton 4701.  
 4LT—E. S. Gars, 113 Pacific Ave., Sunshine Beach 4597.  
 4WR—M. M. Ryan, 6 Olive Cl., Hambour 4560.  
 4ZKP—K. R. Pollock, 24 St. Vincents Rd., Virginia 4014.

## SOUTH AUSTRALIA

- VK5BU/T—F. Bourne, The Rectory, 14 Memorial Dr., Keith 5267.  
 50L—R. Dexter, 37 Adelaide Ter., St. Marys 5042.  
 60Z—E. B. Gliddon, 19 Arnold St., Underdale 5032.  
 5YHN—E. S. Day, 21 Drummond St., Swan Hill 3585.  
 3YLC—B. D. Littlejohn, 19 Armstrong St., Laverton 3025.  
 3ZMX—J. A. Mackenzie, 10/306 Dandenong Rd., East St. Charles 3182.  
 3ZUB—M. A. Cole, Lot 31, Dandenong Heating Rd., Cranbourne 3177.  
 3ZXY—R. J. Pertz, 16 Simmonds St., Oakleigh 3166.

## QUEENSLAND

- VK42BK—I. R. Barnett, 241A Mackenzie St., Toowoomba 4350.  
 4ZHE—J. W. Heares, 58 Elizabeth St., Gladstone 4650.  
 47HA—R. J. Dawy, The Chelmsford 4520.  
 4MC—R. W. Atwood, 27 Brampton Ave., Cranbrook Townsville 4813.  
 4MM—A. S. Millard, 176 Main St., Park Ave., Rockhampton 4700.  
 4WIA—Wireless Institute of Australia, Postal Box 626 GPO Brisbane 4001; Station: 24 Allie St., Aspley 4030.

## SOUTH AUSTRALIA

- VK51D—A. B. Cleave, Smith Street, Port Vincent 5581.  
 5VE—L. M. Leslie, Supt. Reg./Lic, 30 Flinders, Adelaide 5000.  
 5ZON—O. L. Park, 127 Robertson Rd., Moana 5189.

## WESTERN AUSTRALIA

- VK6CI—W. R. Cook, 80 River Drive, Pinjarra 6208.  
 6GN—G. E. Nixon, 69 Haig Rd., Alkdale 6156.  
 6JE—J. E. Charoux, 182 Wellcott St., Mt. Lawley 6050.  
 6LB—L. S. Blackman, 6AM Transmitter, Northam 6401.  
 6OJ—O. Jones, Station: Lot 86, Walpe Way, Duncraig; Postal: Flat 1, 241 Cambridge St., Wembley 6101.  
 8DK—R. Kluwer, 88 Robinson Rd., Morley 6062.  
 6AU—A. C. Graham, 2 Kathleen St., Leamurdie 6078.  
 8VL—E. H. Connery, Lot 2, Holden Rd., Roleyside 5111.  
 8VU—K. E. Pledger, c/o TV Station, Koolan Island 6733.  
 8ZJP—P. W. Jupp, 49 Kooyong Rd., Riverdale 5103.  
 6ZAA—W. J. Howes, 11 Parkside Ave., Mt. Pleasant 6133.  
 6ZQA—R. M. Aysenberg, 19 Forrest Ave., Newman 6753.

## TASMANIA

- VK7TM/T—W. T. Moffat, was VK7TM, 7 Shanuk Dr., West Hobart 7000.  
 7WD—C. Whent, 12 Blackwood St., Grassy, King Island 7256.

## NORTHERN TERRITORY

- VK8RZ—R. J. Verral, Umbakuma, Groote Eylandt.  
 8PO—B. S. Miller, 80 Memorial Ave., Alice Springs.

## CHANGE OF ADDRESS

## VICTORIA

- VK3CJ—C. J. Manning, Cabbage Tree Road, Marlo 3885; Postal: PO Marlo 3888.  
 3FC—C. K. Gibson, Lot 296, Church St., Maldon 3483; Postal: PO Main St., Maldon.  
 3HA—R. F. Meany, Peck Rd., Sydenham 3038.  
 3KB—E. G. Mackay, 380 Glenferrie Rd., Malvern 3144.  
 3LW—A. B. Bradley, 9 Langdon St., Portarlington 3223.  
 3OE—E. N. Planck, 62 Eversham Rd., Cheltenham 3192.  
 3TX—Dr. D. R. Blackman, 129 Clayton Rd., Clayton North 3168.  
 3VE—L. D. Hayward, 192 High St., Wodonga 3690.  
 3AUR/T—R. Wilkins, "Wood View", Byeduck 3285.  
 3BCJ—R. C. C. Jackson, 84 Glenroy Rd., Glenroy 3046.  
 3YFB—C. A. Anderson, 32 Lording Rd., Fenshoe Gully 5155.  
 3ZAZ—S. R. Gregory, 36 Pleasant St., South Ballarat 3350.

- 3ZDT—D. F. Taylor, 60 Auburn Rd., Auburn 3122.  
 3ZHU—A. G. Moritz, 4 Dugdale St., Bacchus Marsh 3240.  
 3ZKL—L. L. Slamm, Lot 28, Timberglades Rd., Montrose 3765.  
 3ZLQ—R. F. Hall, 71 Somers Ave., McLeod 3085.  
 3ZRG—R. J. Roche, 1/2 Thomas St., Kew 3101.  
 3ZTV—A. G. Lyall, 102 Seaford Rd., Seaford 3199.

## QUEENSLAND

- VK4ZEM—P. Mead, 71 Coverdale St., Indooroopilly 4058.  
 4BG—R. J. Glassop, 18 Mentone Ave., Southport 4220.  
 4DJ—J. J. McGroy, 17 Anderson St., Cairns 4870.  
 4LM—L. E. H. Millinson, 53 Waterston St., Annerley 4103.

## SOUTH AUSTRALIA

- VK5DJ—J. F. Drow, 19 Dunlop Ter., Jamestown 5491.  
 5FY—V. Clemence, 267 Salisbury Hwy., Parafield Gardens 5107.  
 6GT—J. F. P. Ingham, 37 Second Ave., Seifton Park 5058.  
 6OJ—J. L. Vesle, 9 Hallett Rd., Enfield 5085.  
 6SU—J. W. K. Adams, 34 Lambell St., Ceduna 5060.  
 6ZPW—L. R. Burton, 25 Myall St., Renmark 5341.  
 6ZWP—P. Clemence, 267 Salisbury Hwy., Parafield Gardens 5107.

## WESTERN AUSTRALIA

- VK6WQ—O. J. Willoughby, 48 Pollack Ave., Balga 6051.  
 6FN—M. L. Faulkner, Station: 65 Mount St., Manjimup 6258; Postal: PO Box 309, Manjimup 6258.  
 6DR—J. G. Herman, 40 Russell St., Morley 6062.  
 6CZ—C. F. Lloyd, 66 Callinan Way, Koonooka 6254.

## VICTORIA

- 6KY/T—G. D. Ogg, 11 Apara Way, Nollamara 3901.  
 6CV—R. W. Walker, Lot 76, Camira Pl., Gooseberry Hill 3078.  
 6LR/T—L. G. Rock, 40 Fairbridge Rd., Mandurah 6210 (now both calls and Postal same).  
 6KS/T—T. Scorer, 14 Bateman Rd., Mt. Pleasant 3133.  
 6FT—F. T. Tuill, Lot 44, Georges Dr., Marjorie Hill 3258.  
 6ZDF—T. W. Robinson, 48 Alfenswood Rd., Glenwood 6224.

## TASMANIA

- VK7ZDF—R. H. Ferris, 15 Fisher Ave., Sandy Bay 7005.

## NORTHERN TERRITORY

- VK8PD—F. D. Baarda, Station: "Yandunna" via Alice Springs; Postal: PO Box 748, Alice Springs 5750.

## CANCELLATIONS

## VICTORIA

- VK33M—K. W. Magee, Not renewed.  
 3VT—V. H. Hudson, Not renewed.  
 3WJ—Dr. F. S. Kantor, Not renewed.  
 3AEU—C. J. Schultz, Not renewed.  
 3AFP—J. H. Power, Not renewed.  
 3ANN—K. A. Veskos, Not renewed.  
 3VAT—T. A. Ragan, Now VK3VY.  
 3BAC—D. A. Moffat, Now VK3FJ.  
 3BCD—E. G. Egan, Now VK3XT.  
 3YBM—R. J. Martinale, Now VK3BMB.  
 3ZDR—R. H. Chapman, Not renewed.  
 3ZJO—E. G. Briggs, Not renewed.  
 3ZYD—C. G. Parnell, Not renewed.

## QUEENSLAND

- VK4ZAM—A. S. Millard, Changed to unrestricted.  
 4ZDW—D. W. Rickard.  
 4ZFL—R. Lymann, Own request.  
 4BA—A. R. Bradley, Non-payment of renewal fees.  
 4KJT—L. Cordell, Transferred to Sydney.  
 4WI—Wireless Institute of Australia. See Section 1 above.

## SOUTH AUSTRALIA

- VK5UM—A. E. Taylor, Transferred to Victoria.  
 5ZA—R. G. Jolly, Transferred to Victoria.

## WESTERN AUSTRALIA

- VK6RJ—R. A. Burgess, Requested.  
 6FQ—R. L. Davies, Transferred to NSW.  
 6ZCO—A. C. Graham, Now unrestricted — see above.  
 6ZGJ—W. Goette, Non-payment of renewal fees.  
 6ZCV—Gaidelisculc. Non-payment of renewal fees.

## TASMANIA

- VK7DZ/T—J. T. Kelly Hart, 835 Sandy Bay Rd., Sandy Bay 7005 (transferred to Queensland).  
 55B—L. S. Brown, 170 Jubilee Hwy., Mt. Gambier 5200.  
 5TH—T. R. Hutchenson, 83 Swallow Dr., Mt. Gambier 5230.  
 5YB—B. A. White, 81 Torrens Rd., Riverton 5142.  
 5ZEF/T—R. J. Foxwell, 39 Watsons Ave., Parkholme 5043.  
 5ZIR—R. W. Edwards, 21 Birks St., Parkside 5053.  
 5ZTS—T. Scholten, 175 Lacey St., Whyalla 5800.  
 WESTERN AUSTRALIA  
 VK5MG—L. P. McGuire, 34 Ripplewood Ave., Thomlie 6108.  
 6MO—A. Parkes, 25 Glosier St., Subiaco 6008.  
 6BD—B. F. Davis, 13 Cars Rd., Greenmount 6056.  
 6IR—J. R. van Laan—Postal: c/o M. A. Nickolas & Assn, PO Box 112, South Perth 6151; Station: Portlanka.  
 6RTT—Carnarvon Amateur Radio Club, Postal: 675 c/o Hermonion PO Box 708, Carnarvon 6701; Station: Unchanged.  
 6RN—M. Rosenthal, Postal: c/o H. T. Mulder, 2 Sedwell St., Emsu Point 6332.  
 6OW—J. J. Willoughby, 48 View Ter., East Fremantle 6153.  
 6ZGM—E. B. McAndrew, Station: Flat 5, 299 Scarborough Beach Rd., Doubleview 6018; Postal: PO Box 116, Doubleview 6018.  
 6ZPL—R. F. Lester, 27 Young St., Carnarvon 6701.  
 6ZHR/T—R. K. Henderson, 24 Forest St., Quairading 6345.

## TASMANIA

- VK7JP—L. J. Dinkin, 6 Cressay, New Town 7008.

## CANCELLATIONS

## VICTORIA

- VK3HL—A. T. Hutchings, Not renewed.  
 3AK—W. H. Kelly, Now VK3XO.  
 3CDS—K. Butcliffe, Transferred to NSW.  
 3YCH—M. G. Loxton, Not renewed.  
 3ZYT—G. S. Taylor, Transferred to Tasmania.  
 3YCS—R. B. Brooks, Now VK3ANO.  
 3YQZ—J. J. Dalwood, Not renewed.  
 3ZQV—J. Butcliffe, Transferred to NSW.

## QUEENSLAND

- VK4BM—V. J. Mead, 8 Cross St., Mitchelton 4253.  
 4ZFL—R. Lymann, 48 Reuben St., Stafford 4053.  
 4ZJF—J. Field, 16 Adsett St., Taringa 4058.

## SOUTH AUSTRALIA

- VK5MZ—F. E. Bentley, Deceased.  
 5ZRH—M. R. Haskard, Now VK5BA.  
 5ZDA—D. M. J. Bates, Transferred to Tasmania.  
 5ZHT—H. G. Tremethick, Not renewed.

## WESTERN AUSTRALIA

- VK6GX—G. N. Marks, Now VK6AL. Note change of address, see New Stations.

- 6PB—Perm Modern School Radio Club, No longer active.  
 6MC—R. W. Atwood, Transferred to Queensland.

## TASMANIA

- VK7DB—A. E. Byrne, Exton 7257 (non payment of renewal fee).  
 7RZ—R. J. Verral, 105 Anther St., West Hobart 7000 (Transferred to NSW).  
 7UY—R. B. Trollope, 74 Maranra Rd., Kingston 7150 (Name changed to R. B. Greenwood — see New Stations).

## NORTHERN TERRITORY

- VK8ZB—G. L. Stephens, Transferred to SA.

## NEW SOUTH WALES

- VK2BHT—H. R. Treman, 8/80 Charlotte St., Ashfield 2131.  
 2ZKZ—R. J. Mitton, 1C/4DA Roslyn Gardens, Elizabeth Bay 2011.

## VICTORIA

- VK3FJ—D. A. Moffat, 13 Nottingham St., Sydnal 3160.  
 3YD—A. Rowan, 2/2 Georges Rd., Toorak 3142.  
 3XT—E. G. Egan, 15 Clunies Cree, Mulgrave 3170.  
 3AOW—M. S. Hodgson, "Pine Ridge" Sheffield 3192.  
 3ATZ—R. E. Glewe, 80 Bernard St., Cheltenham 3192.  
 3BMA—R. J. Martinale, 6 Hora Ct., Glen Waverley 3150.

(To be continued)

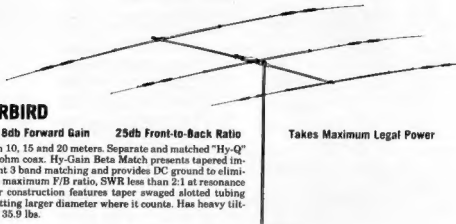
# Hy-Gain NEW SUPER THUNDERBIRD TRIBANDER BEAMS from BAIL ELECTRONICS

## NEW, IMPROVED SUPER 3-Element THUNDERBIRD

- New "Hy-Q" Traps Up to 8db Forward Gain 25db Front-to-Back Ratio

Takes Maximum Legal Power

Delivers outstanding performance on 10, 15 and 20 meters. Separate and matched "Hy-Q" Traps for each band. Feeds with 52 ohm coax. Hy-Gain Beta Match presents tapered impedance which provides most efficient 3 band matching and provides DC ground to eliminate precipitation static resulting in maximum F/B ratio, SWR less than 2:1 at resonance on all bands. Mechanically superior construction features taper swaged slotted tubing allowing easy adjustment and permitting larger diameter where it counts. Has heavy tilt-able boom to mast clamp. Shpg. Wt. 35.9 lbs.



## FABULOUS THUNDERBIRD JUNIOR

- Up to 8db Forward Gain 25db Front-to-Back Ratio
- Takes up to 300 Watts AM; 600 Watts P.E.P.
- Rotates with Heavy Duty TV Rotator Turning Radius 14.3 ft.

If you're looking for top performance on 10, 15 and 20 meters but are hampered with severe space limitations, you'll want the Model TH3JR. Constructed of durable, lightweight taper-swaged aluminum tubing, the Model TH3JR is ideal for rooftop or lightweight tower installations. Separate and matched "Hy-Q" traps for each band. Feeds with 52 ohm coax - Beta Matched for optimum gain, maximum F/B ratio without compromise. SWR less than 2:1 at resonance on all bands. Molded high impact cycolac insulators - all hardware iridite treated to MIL specs. Shpg. Wt. 20.4 lbs.



### SPECIFICATIONS

#### ELECTRICAL

Gain  
Front-to-Back Ratio  
Maximum Power Input

#### Model TH3MK3

8db  
25db  
1 KW, AM  
Less than 2:1  
52 ohms

#### Model TH3JR

8db  
25db  
300 Watts AM;  
600 Watts PEP  
Less than 2:1  
52 ohms

#### MECHANICAL

Longest Element  
Boom Length  
Turning Radius  
Wind Load At 80 MPH  
Maximum Wind Survival  
Net Weight  
Mast Diameter  
Surface Area

27 ft.  
14 ft.  
15.7 ft.  
103.7 lbs.  
100 MPH  
36 lbs.  
1 1/4" to 2 1/2"  
4.03 sq. ft.

24.2 ft.  
12 ft.  
14.3 ft.  
87.0 lbs.  
80 MPH  
21 lbs.  
1 1/4 to 1 1/2"  
3.4 sq. ft.

### TRIBANDER BALUN



60 Shannon St., Box Hill North, Vic., 3129. Ph. 89-2213

**BAIL ELECTRONIC SERVICES**

OLD: MITCHELL RADIO CO., 68 Albion Road, Albion, 4019  
N.S.W.: STEPHEN KUHLE, P.O. Box 56, Mascot, 2020  
S.A.: FARMERS RADIO PTY. LTD., 257 Angus Street, Adelaide, 5000  
W.A.: H. R. PRIDE, 26 Lockhart Street, Como, 6152

Ph.: 57 6830  
Ph. Day 607 1650  
A.N.: 371 5445  
Ph.: 23 1256  
Ph.: 60 4370